

The

Communicator

March 2019



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CONTACTS

(778) 683-4662

General Correspondence
12144 - 57A Avenue
Surrey, BC V3X 2S3
[SARC at ve7sar.net](http://SARC.at.ve7sar.net)

Operations & Training Centre
14265 - 57 Avenue
Surrey, BC

COMMUNICATOR & BLOG EDITOR

John Schouten VE7TI
[communicator at ve7sar.net](mailto:communicator@ve7sar.net)

WEBMASTER

Jeremy Morse VE7TMY
[webmaster at ve7sar.net](mailto:webmaster@ve7sar.net)

The **Communicator** is a publication of Surrey Amateur Radio Communications. It appears monthly, except July and August, for area Amateur Radio operators and beyond, to enhance the exchange of information and to promote ham radio activity.

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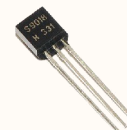
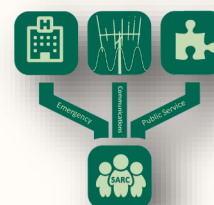
Regular readers who are not SARC members are invited to contribute a \$5 annual [donation](#) towards our Field Day fund via [PayPal](#).

SARC maintains a website at www.ve7sar.net and a Digital Communicator at ve7sar.blogspot.ca that includes recent news, past issues of The Communicator, our history, photos, videos and other information.

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On The March Cover...

Our Radio-Active member profiled this month is Les Tocka VA7OM. Les is a relatively new SARC member although he has been involved with the group for years, primarily as a result of his fox hunting activities. He is a man of many talents and is shown here at his home station.

But, there is lots more in this edition... Enjoy!





QRM

---... ---

...from the Editor's Shack

*Do you have a photo or bit of SARC news to share?
An Interesting link?*

*Something to sell or something you are looking for?
eMail it to [communicator @ ve7sar.net](mailto:communicator@ve7sar.net) for inclusion in this publication.*

Well, we are approaching the end of Winter. Good riddance? It has been a bit challenging the past few weeks with large snowfalls rather than our usual rain, but it has been great weather for doing some 'hamming'. I have thoroughly immersed myself in FT8, following up on the January Communicator articles. It continues to amaze me and provides me with contacts when all other modes seem dead. I even worked the southern tip of Chile, some 14,000 Km (8,000 miles). I had to keep checking for snow on my HF Yagi but it tuned up just fine as did my OCF dipole. I found that 15 and 20m stayed alive until about 16:30 hrs and then I could play a bit more on 40m until about 1730 hrs, which was time for the BC Public Service Net (BCPSN).

Conditions are still very poor for the phone modes. The BCPSN, every afternoon at 1730 hrs on 3729 MHz has been sporadic and the band has just dropped out suddenly.

The BC QSO Party was a great success for me personally. Operating high power multi-multi at VE7IO with the assistance of several others, we were able to obtain a great team score. Our SARC station VE7SAR was also on the air and John VA7XB has a write-up in this edition.

Net attendance has been rather sporadic. Myself, Stan VA7NF and John VA7XB have been at the Basic course on Tuesday

evenings since early January but, due to a class cancellation resulting from the snow, I was able to participate on February 12th. I was disappointed by the few check-ins—maybe everyone was out there shoveling? I suppose this is not entirely unique to VE7SAR, as several area nets through the week seem less than busy, but I'm hopeful that we can boost the numbers and get some life into the round-table that follows the SARC net.

Our Basic course is coming along and we just completed two antenna building workshops at the OTC. We chose to split the class into two groups so that we could better provide individual assistance. We did run into an issue not encountered before with adjustment. Some students' antennas just would not tune. A great deal of frustration later we have now isolated that issue and found that a different coax or some additional pruning brings the antenna to less than 1.5:1 SWR as it should be.

This design has been a tried and true favourite for a number of years and results in a dual-band gain antenna that is easily transported and stored. The April Communicator will feature a number of home-built antenna designs and I invite you to send in your favourite for inclusion. Email to communicator@ve7sar.net

~ John VE7TI
Communicator Editor

On the Web

ve7sar.net

Between newsletters, watch your e-mail for news, announcements of Amateur Radio events, monthly meetings and training opportunities.

Click the links below to follow our presence on the web:

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ve7sar.blogspot.ca

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SARC Photo Albums
[Web Albums](http://WebAlbums)

or

tinyurl.com/SARCphoto

The thing to remember is that the future comes one day at a time.—Dean Acheson

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The Rest Of The Story...

Alexander Stepanovich Popov

Russia's Marconi?

Alexander Stepanovich Popov (sometimes spelled Popoff (March 16, 1859 - January 13, 1906) was a Russian physicist who is acclaimed in his homeland and some eastern European countries as the inventor of radio.



Alexander Popov

Popov's work as a teacher at a Russian naval school led him to explore high frequency electrical phenomena. On May 7, 1895 he presented a paper on a wireless lightning detector he had built that worked by using a coherer to detect radio noise from lightning strikes.

This day is celebrated in the Russian Federation as Radio Day.

In a March 24, 1896 demonstration, he used radio waves to transmit a message between different campus buildings in St.

Petersburg. His work was based on that of another physicist - Oliver Lodge, and contemporaneous with the work of Guglielmo Marconi. Marconi registered a patent with a description of the device two months after the first transmission of radio signals made by Popov.

Early life

Born in the town of Krasnoturinsk, Sverdlovsk Oblast in the Urals as the son of a priest, he became interested in natural sciences when he was a child. His father

wanted Alexander to join the priesthood and sent him to the Seminary School at Yekaterinburg. There he developed an interest in science and mathematics and instead of going on to Theology School in 1877 he enrolled at St. Petersburg university where he studied physics. After graduation with honors in 1882, he stayed on as a laboratory assistant at the university. However the salary at the university was inadequate to support his family, and in 1883 he took a post as teacher and head of laboratory at the Russian Navy's Torpedo School in Kronstadt on Kotlin Island.

Radio wave receiver

Along with his teaching duties at the naval school, Popov pursued related areas of research. Trying to solve a problem with the failure in the electrical wire insulation on steel ships (which turned out to be a problem with electrical resonance) led him to further explore oscillations of high frequency electrical currents. His interest in this area of study (including the new field of "Hertzian" or radio waves) was intensified by his trip in 1893 to the Chicago World's Columbian Exposition in the United States, where he was able to confer with other researchers in the field.

Popov also read an 1894 article about British physicist Oliver Lodge's experiments related to the discovery of radio waves by German physicist Heinrich Hertz 6 years earlier. On 1 June 1894, after the death of Hertz, British physicist Oliver Lodge gave a memorial lecture on Hertz experiments. He set up a demonstration on the quasi optical

nature of Hertzian waves (radio waves) and demonstrated their transmission at distances up to 50 meters. Lodge used a detector called a coherer, a glass tube containing metal filings between two electrodes. When received waves from an antenna were applied to the electrodes, the coherer became conductive allowing the current from a battery to pass through it, with the impulse being picked up by a mirror galvanometer. After receiving a signal, the metal filings in the coherer had to be reset by a manually operated vibrator or by the vibrations of a bell placed on the table nearby that rang every time a transmission was received. Popov set to work to design a more sensitive radio wave receiver that could be used as a lightning detector, to warn of thunderstorms by detecting the electromagnetic pulses of lightning strikes, using a coherer receiver

In Popov's lightning detector [pictured below] the coherer (C) was connected to an antenna (A), and to a separate circuit with a relay (R) and battery (V) which operated an electric bell (B). The radio noise generated by a lightning strike turned on the coherer, the current from the battery was applied to the relay, closing its contacts, which applied current to the electromagnet (E) of the bell, pulling the arm over to ring the bell. Popov added an innovative automatic reset feature of a "self tapping" coherer where the bell arm would spring back and tap the coherer, restoring it to its receptive state. The two chokes (L) in the coherer's leads prevented the radio signal across the coherer from short circuiting by passing through the DC

circuit. He connected his receiver to a wire antenna (A) suspended high in the air and to a ground (earth) (G). The antenna idea may have been based on a lightning rod and was an early use of a monopole wire aerial.

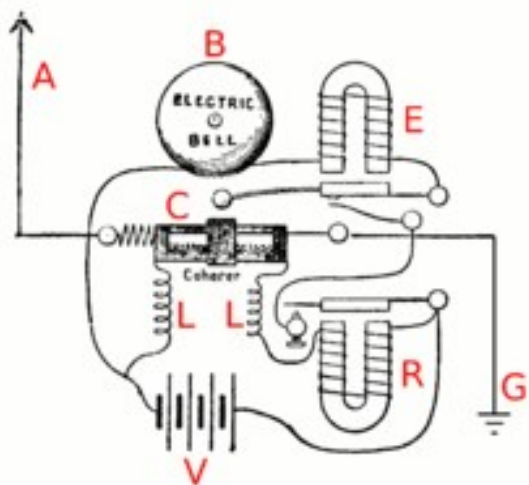
Demonstrations

On 7 May 1895, Popov presented the paper "On the Relation of Metallic Powders to Electric Oscillations", which described his lightning detector, to the Russian Physical and Chemical Society in St. Petersburg. Most Eastern sources regard Popov's lightning detector as the first radio receiver, and the 7th of May has been celebrated since 1945 in the Russian Federation as "Radio Day". However, there is no evidence Popov sent any type of message on that occasion. The first account of communication by Popov was a demonstration on 24 March 1896 at the Physical and Chemical Society, when some accounts say the Morse code message "ГЕНРИХ ГЕРЦ" ("HEINRICH HERTZ" in Russian) was received from a transmitter 250 meters away and transcribed on the blackboard by the Society president. Historian Charles Susskind in 1962 concluded that Popov did not use radio waves for actual wireless communication before mid-1896.

In 1895 Italian inventor Guglielmo Marconi began work on a purpose built wireless telegraphy system based on "Hertzian" (radio) waves, developing a spark-gap transmitter and a much improved automatically-reset coherer receiver. By mid-1895 Marconi had transmitted messages 1/2 mile (1600 meters). He then came up with the idea grounding his transmitter as well as his receiver and by mid-1896 he was transmitting radio messages a mile and a half (2400 meters). Popov and Marconi's early work seems to have been done without knowledge of each other's system although reading Marconi's June 1896 patent disclosures led Popov to develop a long range wireless telegraphy system.

His paper on his experiments: "On the relation of metallic powders to electrical oscillations", was published 15 December 1895. He did not apply for a patent for his invention. In July 1895 he installed his receiver and a siphon recorder on the roof of the Institute of Forestry building in St. Petersburg. and was able to detect thunderstorms at a range of 50 km, however he was also aware of its communication potential. His paper, read at the 7 May 1895 meeting, concluded:

Circuit of Popov's lightning detector



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Above, a Russian QSL card received by John Brodie VA7XB (then VE7BFE) in 1961.

Below, one of Popov's receivers, with chart recorder (white cylinder) to record lightning strikes



"I can express my hope that my apparatus will be applied for signaling at great distances by electric vibrations of high frequency, as soon as there will be invented a more powerful generator of such vibrations."

In 1896, the article depicting Popov's invention was reprinted in the 'Journal of the Russian Physical and Chemical Society'. In March 1896, he effected transmission of radio waves between different campus buildings in St. Petersburg. In November 1897, the French entrepreneur Eugene Ducretet made a transmitter and receiver based on wireless telegraphy in his own laboratory. According to Ducretet, he built his devices using Popov's lightning detector as a model. By 1898, Ducretet was manufacturing equipment for wireless telegraphy based on Popov's instructions. At the same time Popov effected ship-to-shore communication over a distance of 6 miles in 1898, and 30 miles in 1899. ,

In 1900 a radio station was established under Popov's instructions on Hogland island (Suursaari) to provide two-way communication by wireless telegraphy between the Russian naval base and the crew of the battleship General-Admiral Apraksin. The battleship had run aground on Hogland island in the Gulf of Finland in November 1899. The crew of the Apraksin were not in immediate danger, but the water in the Gulf began to freeze. Due to bad weather and bureaucratic red tape, the crew of Apraksin did not arrive until January

1900 to establish a wireless station on Hogland Island. By February 5, however, messages were being received reliably. The wireless messages were relayed to Hogland Island by a station some 25 miles away at Kymi (nowadays Kotka) on the Finnish coast. Kotka was selected as the location

for the wireless relay station because it was the point closest to Hogland Island served by telegraph wires connected to Russian naval headquarters.

By the time the Apraksin was freed from the rocks by the icebreaker Yermak at the end of April, 440 official telegraph messages had been handled by the Hogland Island wireless station. Besides the rescue of the Apraksin's crew, more than 50 Finnish fishermen, who were stranded on a piece of drift ice in the Gulf of Finland, were saved by the icebreaker Yermak following distress telegrams sent by wireless telegraphy. In 1901 Alexander Popov was appointed as professor at the Electrotechnical Institute, which now bears his name. In 1905 he was elected director of the institute.

Death and legacy

In 1905 he became seriously ill and died of a brain hemorrhage on January 13, 1906. A minor planet, 3074 Popov, discovered by Soviet astronomer Lyudmila Zhuravlyova in 1979, is named after him. At ITU Telecom World 2011, Igor Shchyogolev, Minister of Telecom and Mass Communications of the Russian Federation alongside Hamadoun Touré, Secretary General of the ITU, inaugurated the "Alexander Stepanovich Popov" conference room at ITU's headquarters in Geneva.

Family

Some of his descendants escaped to Manchuria during the Bolshevik Revolution and eventually made their way to the United States. Among others were his cousin, Dr. Paul Popov, who became a prominent physician in San Francisco and Paul's son, Egor Popov (1913-2001), who became a UC Berkeley Professor Emeritus of Civil and Environmental Engineering

And that... is the rest of his story.

~



The Solar Minimum

John Schouten VE7TI

Are We There Yet?

You have heard me mention the lack of DX activity on the phone bands in the past several issues of The Communicator. But what exactly is meant by solar minimum, or maximum for that matter?

Solar minimum is the period of least solar activity in the 11 year solar cycle of the Sun. During this time, sunspot and solar flare activity diminishes, and often does not occur for days at a time. The date of the minimum is described by a smoothed average over 12 months of sunspot activity, so identifying the date of the solar minimum usually can only happen 6 months after the minimum takes place. Solar minima are generally correlated with changes in climate and recent studies have shown a correlation with regional weather patterns. Solar minimum is contrasted with the solar maximum, where there may be hundreds of sunspots.

The sun is heading toward solar minimum now—better yet, we hope we are there. Sunspot counts were relatively high in 2014, and now they are sliding toward a low point expected in 2019-2020. While intense activity such as sunspots and solar flares subside during solar minimum, that doesn't mean the sun becomes dull. Solar activity simply changes form.

For instance, during solar minimum we can see the development of long-lived coronal holes. Coronal holes are vast regions in the sun's atmosphere where the sun's magnetic field opens up and allows streams of solar particles to escape the sun as the fast solar wind.

We see these holes throughout the solar cycle, but during solar minimum, they can last for a long time - six months or more. Streams of solar wind flowing from coronal holes can cause space weather effects near Earth when they hit Earth's magnetic field. These effects can include temporary disturbances of the Earth's magnetosphere, called geomagnetic storms, auroras, and disruptions to communications and navigation systems.

Their unpredictable character makes predictions of solar activity very difficult. observed sunspot numbers. During 2008-09 NASA scientists noted that the Sun is undergoing a "deep solar minimum," stating: "There were no sunspots observed on 266 of [2008's] 366 days (73%). Prompted by these numbers, some observers suggested that the solar cycle had hit bottom in 2008. Sunspot counts for 2009 dropped even lower. As of September 14, 2009 there were no sunspots on 206 of the year's 257 days (80%).

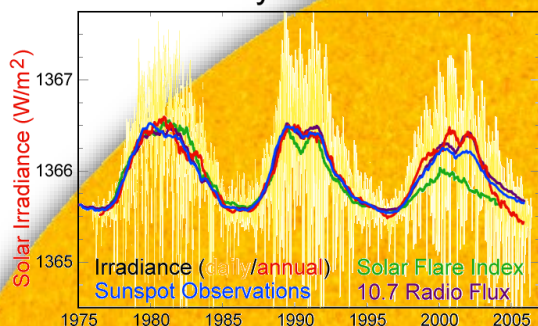
It adds up to one inescapable conclusion: "We're currently experiencing a very deep solar minimum," says solar physicist Dean Pesnell of the Goddard Space Flight Center. "This is the quietest sun we've seen in almost a century."

We hope it gets better, but we may have to wait a couple of years. In the meantime, there's FT8.

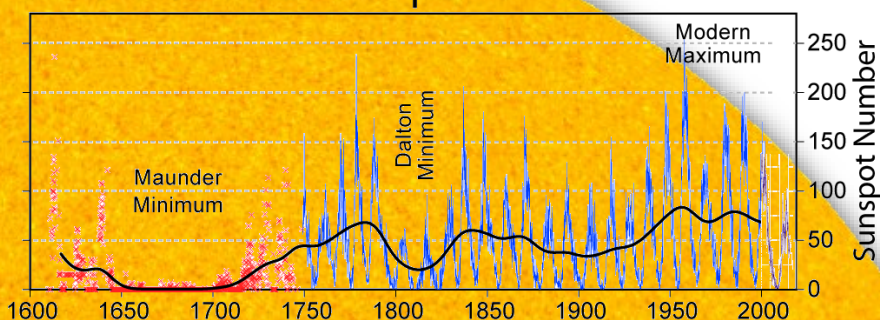
More on HF Propagation at Sunspot Minimum from a RSGB Convention lecture: <https://youtu.be/mDGVk-a88Y8>

~ John VE7TI

Solar Cycle Variations



400 Years of Sunspot Observations



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Back to Basics

John Schouten VE7TI

From The Canadian Basic Question Bank



A transformer is a device that transfers electrical energy from one circuit to another through inductively coupled electrical conductors.

This month a closer look at transformers. Our sample question:

B-003-017-005 A power supply is to supply DC at 12 volts at 5 amperes. The power transformer should be rated higher than:

1. 17 watts
2. 2.4 watts
3. 6 watts
4. 60 watts

First the basics. Whenever electrons flow through a conductor, a magnetic field will develop around that conductor, this is called electromagnetism. Lets also review Inductors. They are components designed to take advantage of this electro-magnetism. By shaping the length of conductive wire in the form of a coil, the shape creates a stronger magnetic field than what would be produced by a straight wire. Some inductors are formed with wire wound in a self-supporting coil. Others wrap the wire around a solid core material of some type. Sometimes the core of an inductor will be straight, and other times it will be joined in a loop (square, rectangular, or circular) to fully contain the magnetic flux. These design options all have effect on the performance and characteristics of inductors.

<https://youtu.be/ukBFPrXiKWA> and <https://youtu.be/STDlCdZnlsw> for detailed video explanations.

Just as a magnetic field can produce a current, a current traveling through a

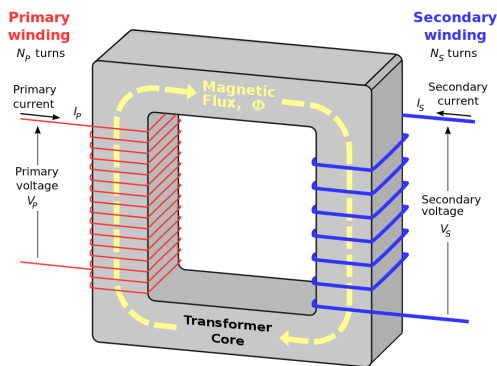
conductor produces a magnetic field. This field, seen as lines of flux, increases or decreases coincident with changes in the current flow. A nearby conductor in the changing magnetic field will have a current **induced** in it, just as if a moving magnet had changed the surrounding magnetic field. Induction is one current causing a second current because of the movement of its magnetic field.

At the moment a switch is turned on, closing a circuit and sending current through a conductor (the primary current), the changing magnetic field induces current in a second nearby conductor (secondary current). This secondary current moves in a direction opposite to the current of the first conductor. In a DC circuit, the primary current stabilizes rapidly, the magnetic field becomes constant, and the secondary current quickly disintegrates. When a switch is turned OFF (opening the circuit), the primary current's collapsing magnetic field induces a brief current in the second conductor, moving in the same direction as the primary current. Induction also occurs within the same conductor.

Physicist Michael Faraday is credited for discovering the inductive effect in 1831, shortly after American physicist Joseph Henry made the same discovery. Henry, unfortunately, did not publish his findings.

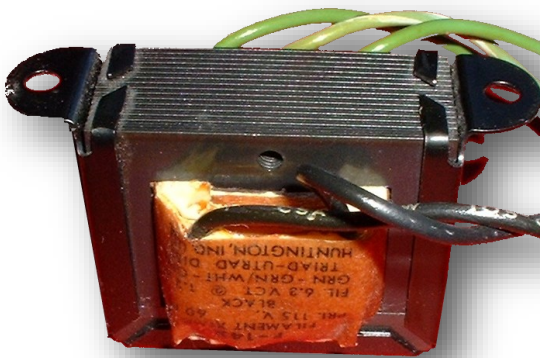
Circuits can use induction in many ways to manipulate the flow of current. Mutual inductance involves the relationship between two separate conductors, each

with its own magnetic field, and the effects of their expanding and contracting lines of magnetism that act on the current of the other conductor. Arrangements of the conductors can either help or hinder the other current based on their placement, their growing and shrinking magnetic fields and their current's corresponding directions.



A transformer is a device that transfers electrical energy from one circuit to another through **inductively** coupled electrical conductors. A changing current in the first circuit (the primary) creates a changing magnetic field; in turn, this magnetic field induces a changing voltage in the second circuit (the secondary). By adding a load to the secondary circuit, one can make current flow in the transformer, thus transferring energy from one circuit to the other.

The secondary induced voltage, E_s is scaled from the primary, E_p by a factor ideally equal to the ratio of the number of turns of wire in their respective windings.



By appropriate selection of the numbers of turns of wire, a transformer thus allows an alternating voltage (AC) to be stepped up – by making N_s more than N_p – or stepped down, by making it less.

Transformers are some of the most efficient electrical 'machines', with some large units able to transfer 99.75% of their input power to their output.

Transformers come in a range of sizes from a thumbnail-sized coupling transformer hidden inside a microphone to huge units weighing hundreds of tons used to interconnect portions of national power grids. All operate with the same basic principles, though a variety of designs exist to perform specialized roles throughout home and industry.

Calculating transformer voltage and turns

$$\frac{E_s}{E_p} = \frac{N_s}{N_p}$$

E_s = voltage through secondary coil

E_p = voltage through primary coil

N_s = number of turns in secondary coil

N_p = number of turns in primary coil

Calculating voltage and turns

$$E_p = 110 \text{ V}$$

$$N_s = 60 \text{ turns}$$

$$N_p = 500 \text{ turns}$$

$$E_s = \frac{N_s \times E_p}{N_p}$$

$$E_s = \frac{N_s \times E_p}{N_p}$$

How many volts in the secondary E_s ?

therefore $E_s = 60 / (500 \times 110)$ which equals 13.2 volts

$$E_s = \frac{60}{500} \times 110$$

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The number of turns in the primary and secondary coils determine the type of transformer.

More turns in primary = **step-down** transformer; and more turns in secondary = **step-up** transformer. There are also transformers with an equal number of turns in the primary and secondary. These are generally used to isolate circuits. An example of the latter is the 'razor only' outlet found in older bathrooms. In order to protect the user from electric shock a transformer was installed in an oversized electrical outlet box. This decoupled the AC circuit from ground but still delivered 110 volts AC for use by low current appliances such as electric razors. Because of their size, only low currents could be accommodated. Plugging in a curling iron would blow the transformer. Nowadays ground fault circuit interrupters (GFCI) outlets are used, and they are much more reliable.

A video about transformers is available at:

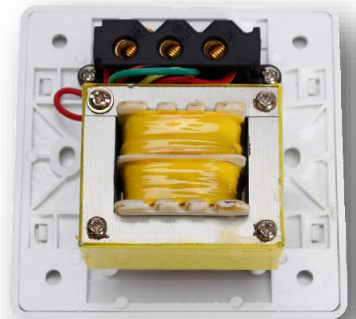
<https://youtu.be/agujzHdvtjc>

Back to our question. A power supply is to supply DC at 12 volts at 5 amperes. The power transformer should be rated higher than?

Power = $E \times I$, so this power supply has a rating of $12 \times 5 = 60$ watts output. So your transformer would have to be rated higher than 60 watts.

Therefore the correct answer to this month's question is number 3, 60 Watts.

~ 73, John VE7TI



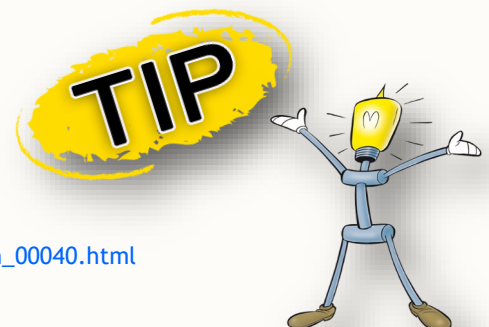
Study Links

Whether you are new to the hobby or brushing up on skills, you should find these study links helpful:

1. RIC-7 is the entire up-to-date Industry Canada (IC) Basic Question Bank.
<http://tinyurl.com/CanadaBasicQB>
2. There is a RIC-7 that has some explanations along with the questions.
[RIC-7 2014rev08.05 with explanations.](#)
3. The Amateur Radio Exam Generator is at: https://www.ic.gc.ca/eic/site/025.nsf/eng/h_00040.html
4. The ExHaminer Study software for Windows is at: <https://wp.rac.ca/examiner-v2-5/>
5. There are plenty of good resources for both basic and advanced exam study courtesy of the Cold Lake Amateur Radio Society at: <http://www.clares.ca/va6hal%20training.html>

Contact SARC if you wish to write the Basic or Advanced Exam. If you pass we'll even give you a year's free SARC membership!

Newly Licensed? When you receive your paper license in the mail, it will come with a form that can be filled out and mailed to the Radio Amateurs of Canada office, at which point an introductory RAC one-year membership will be set up. Introductory memberships are identical to our existing basic memberships and you will receive the The Canadian Amateur magazine for one year.



Wire Snippets

Missing Ham plates in Corner Brook, Newfoundland, apparently caused by those who steal to sell them to collectors. Let's hope the trend doesn't surface here:

<https://www.thepacket.ca/news/local/case-of-the-missing-plates-corner-brook-ham-radio-operators-specialty-licence-plates-stolen-281688/>

Ah, the 21st century, for those of us who spent appreciable time in the twentieth century, we were told of amazing things like flying cars, anti-gravity and meal in a pill. In many ways, we are disappointed by some of the misses, and perhaps happy that others did not come through.... The [dawn of wireless power](#)

A couple of issues ago we heard about Ham radio used for exchanging stock trades. This week it was used for sending bitcoin. This, apparently, can be done. See how at <https://news.bitcoin.com/no-internet-no-problem-how-to-send-bitcoin-by-amateur-radio/>

Neighbourhood Emergency Preparedness How Would Your Neighbourhood Respond?

The Surrey Neighbourhood Emergency Preparedness Program helps neighbourhoods identify the skills and resources that would be useful in a disaster, and teaches them how to respond safely and effectively in organized teams. The goal is to prepare neighbourhoods to be self-sufficient for at least 72 hours after a disaster.

Read more to learn about how the program works and be sure to download these handy tool kits:

- [Neighbourhood Tool Kit](#)
- [Disaster Recovery Tool Kit](#)
- [C-MIST Emergency Card](#)

[More information](#)

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Sun	Mon	Tue	Wed	Thu	Fri	Sat
	For details on all SARC events, go to ve7sar.net For details on all SEPARS events, go to separ.shutterfly.com/calendar				1	2 08-1000 SARC Social: Kalmar Family Restaurant King George Blvd & 81st Avenue CONTEST: ARRL Inter. DX (SSB)
3 Burnaby ARC Swap Meet CONTEST: ARRL Inter. DX (SSB)	4	5 1930 SEPAR Net 2000 SARC Net	6	7	8	9 08-1000 SARC Social: Kalmar Family Restaurant CONTEST: OK, ID and WI QSO Party (all modes); RSGB Commonwealth (CW)
10 CONTEST: OK, ID and WI QSO Party (all modes); RSGB Commonwealth (CW)	11	12 1930 SEPAR Net 2000 SARC Net	13 1900 SARC General Meeting	14	15	16 08-1000 SARC Social: Kalmar Family Restaurant CONTEST: BARTG (RTTY); VA and LA QSO Party (all modes)
17 CONTEST: BARTG (RTTY); VA and LA QSO Party (all modes)	18	19 1930 SEPAR Net 2000 SARC Net	20	21	22	23 08-1000 SARC Social: Kalmar Family Restaurant
	Spring Break for Surrey Schools—Mar 18-22					
24/31 CONTEST Mar 24: NA Sprint (SSB) Mar 31: CQ WW WPX (SSB)	25	26 1930 SEPAR Net 2000 SARC Net	27 1900 SARC Exec Meeting	28	29	30 08-1000 SARC Social: Kalmar Family Restaurant CONTEST: CQ WW WPX (SSB)

Contest Details: <http://hornucopia.com/contestcal/contestcal.html>



~ Ham Hijinks



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Operations & Training Centre News

John Brodie VA7XB

Progress



The cold, snowy conditions of February provided little opportunity to undertake any outside chores. However, the OTC committee did meet on 30 January to finalize selection of two items in fulfilment of our gaming grant spending priorities.

A Honda 3 kw generator was acquired for Field Day and emergency use. In addition, the old 5 kw Pincor generator that has sat unused for several years and which was attached to the yellow tower has been removed by Michael VE7GMP and taken to Fraser Valley Equipment for servicing. Being a 240 volt generator and therefore suitable for interfacing with our 208 v AC power source at the OTC, the generator should soon be ready for emergency use when needed. We do need to think about where to safely and conveniently store fuel for both generators.

Progress is also underway with preparation of devices that will allow high power operation of two radios simultaneously. Les VA7OM and John VA7XB are collaborating on constructing the following units: a 10-15-20 m triplexer, a 40-80 diplexer and bandpass filters for 10 through 80 m. Les has the first item nearly completed and both Les and John will be moving ahead with the other items over the next month or so. We are indebted to Pavel VA6AM for his willing assistance in locating difficult-to-find HV capacitors, providing the schematics for his

designs and offering assistance with other construction details.

During the cold snowy snap just before the ARRL DX CW contest on the weekend of 16-17 February, both our beam and wire antennas showed severe problems (i.e. swr >10). The wire antenna was found to be touching branches causing the swr

to go sky-high every time a branch came in contact with the tree. With some effort to adjust the support ropes moments before dark on Friday, the wire was pulled farther away, which cured the problem.

It was not so simple with the beam. Inspection on the roof showed that the problem is right at the beam itself, so we apparently have either a bad coax connection or some frost damage, possibly at the balun. We await a more hospitable day (if such exist at this time of year) to further investigate and repair.

Following Steve McLean's (VE7SXM) discussions with Expert Linears in Texas, and our updating of the firmware for Expert Linear 1.5 amplifier, we had an opportunity to test the performance of the amp during the CW contest on 16-17 February. I'm glad to report that the amp performed well without any over-heating issues, so perhaps our amplifier troubles are now behind us.

What's next: we await decisions of the Public Service Group regarding items which they wish to purchase to fulfil their goals. These are understood to include the ability to communicate on VHF and UHF with digital messaging using packet. The PS Group will be sharing space in the SEPAR room once this gear is acquired, which requires various preparations for the cabling and power needs.

We see an opportunity to interface Neighbourhood Emergency Preparedness Planning (NEPP) with the Public Service Group activities, as the benefits and means of fulfilling the needs are shared. One high priority matter will be to secure a BC WARN microwave link from our repeater site and the EOC (Firehall 1) to the OTC. In order to do this, we will need to raise the height of our microwave dish another 20 ft or so to get over line-of-sight obstructions between the OTC and Concord tower.

~ 73, John VA7XB



The Contest Contender

John Brodie VA7XB

BC QSO Party



The winter contesting months provide ample opportunity to test our operating skills, and February was no exception.

The BC QSO Party in early February is one of the contest highlights of the year for BC hams, and SARC did its part to show the flag. Conditions were poor as is normal at this low point of the sunspot cycle, but our team comprised of VE7ADA, VA7OM, VA7VJ, VE7CZV, VE7KGK, VA7FMR, VE7TI, VE7GMP and VA7XB managed 546 CW, RTTY and SSB contacts for a claimed score of 416,362.

It is noteworthy that Rob VE7CZV using a Braille reader and "Jaws" software on the IC-756 Pro II was able to log some SSB Qs and help bring up the score.

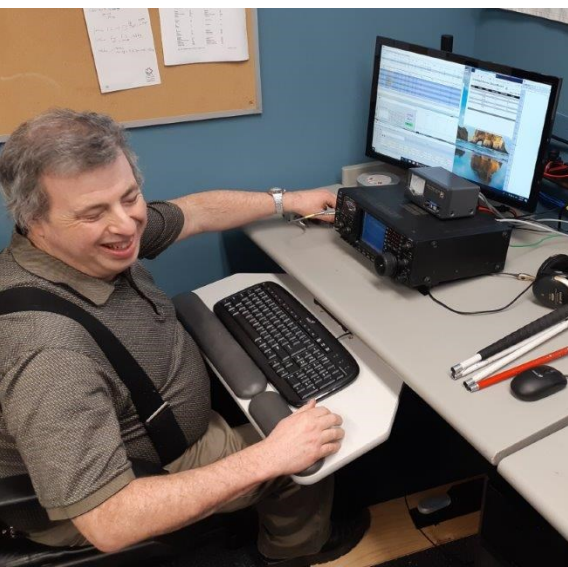
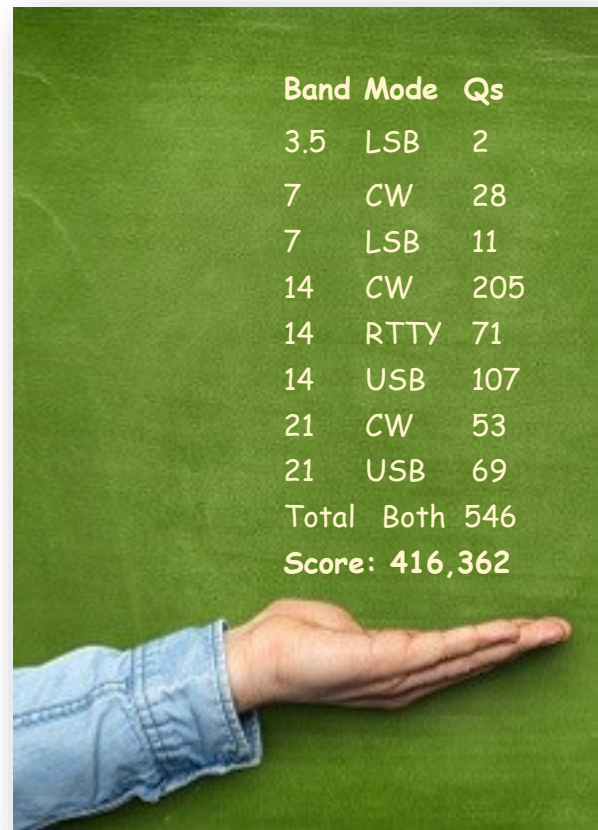
We are not yet set up to operate more than one radio at high power, so with the large number of participants it was strictly a 2-radio, low power effort.

With several other contests from which to choose in February, we also decided to tackle the ARRL international DX contest for CW on 16-17 Feb.

Our CW team was comprised of Slawa VE7LWW, Les VA7OM, Jan VA7VJ and John VA7XB.

As reported elsewhere in this Communicator, we had the misfortune of having the tri-band beam fail during the cold, snowy weather which preceded the DX contest. This handicapped our ability to compete in the high power category, as all contacts were made with the wire antenna, which required some last minute geometry adjustments to stop the wire from coming into contact with tree branches.

Band	Mode	Qs
3.5	LSB	2
7	CW	28
7	LSB	11
14	CW	205
14	RTTY	71
14	USB	107
21	CW	53
21	USB	69
Total	Both	546
Score:		416,362



March 2019

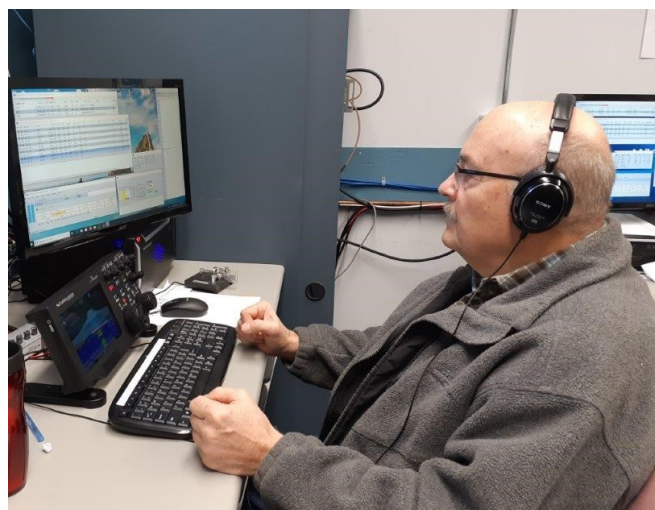
Surprisingly, even with the wire antenna we were able to get our signal into Europe, Asia, South America and the Caribbean however it was not the same experience without the beam. Nevertheless, we made 383 DX contacts for a score of 184,842 points (North American contacts do not count for this contest).



What's coming up next month, you ask?

- 2-3 March ARRL Inter. DX (SSB)
- 9-11 March OK, ID and WI QSO Party (all modes)
plus RSGB Commonwealth (CW)
- 16-18 March BARTG (RTTY) plus VA and LA QSO
Party (all modes)
- 24 March NA Sprint (SSB)
- 30-31 March CQ WW WPX (SSB)

~ John VA7XB





Radio Ramblings

Kevin McQuiggin VE7ZD/K7MCQ

The Hardrock-50 Linear Amplifier Kit

Synopsis

The Hardrock-50 (see Figure 1) is a US-designed, 5W-in to 50W-out HF amplifier that operates on the 160 through 6m amateur bands. It includes automatic band switching, does not require tuning, and integrates seamlessly with popular rigs such as the Elecraft KX3 or Yaesu FT-817 series. An optional QSK board and automatic antenna tuner are available. The amplifier runs on 13.8 VDC and draws under 10 amps at full output.

The HR-50 is provided as a well-documented kit and can be assembled in about ten hours. It aligns easily using common test equipment and performs well. My own kit easily out-performed the amplifier's design specs. Price is US\$299 from Hobby PCB in Florida at <https://hobbypcb.com>.

Background

Having recently returned to amateur radio, I was interested in the new digital modes, and especially the new digital HF mode FT8. My new Elecraft KX3 performed very well on the mode, and I was able to achieve WAS (Worked All States) in about three weeks using the radio's maximum recommended digital output of 5 watts into my 23-metre longwire antenna.

That said, working DX using FT8 while QRP was quite difficult, and although I worked a small number of foreign

stations, I found that it took quite a bit of effort to be heard among the other stations who were using higher power and better antennas than I have. I had no problem *hearing* considerable DX; the problem was that they usually did not hear me. Something had to be done!

I started researching linear amplifiers with an output of 50 to 100 watts, thinking that being able to boost my signal at the antenna would likely make me more competitive and allow me to work much of the interesting DX that I had been hearing.

I learned that 100-watt class amplifiers were either low quality and affordable, or of high quality, but more expensive than my limited budget would allow. Reviews of some of the cheap amplifiers showed them to generate high amounts of distortion and even spurious illegal emissions. Not something that I would allow in my station!

Additionally, I doubted the necessity of running 100 watts on FT8 (my main communication interest) as the mode performs so well on very weak signals that more than 10-30 watts is hardly ever required to work global DX. 50 watts would give me enough "edge" to work a lot of DX.

Figure 1 –
The Hardrock-50 Amplifier



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The prototype for the Hardrock-50 was a winner in a design contest sponsored by the ARRL in 2010.

My extensive research led me to a US-designed amplifier kit called the “Hardrock-50”, from a small firm called “Hobby PCB”¹ in the eastern US. The amplifier covers 160 through 10 metres with an output of approximately 50 watts for 5 watts input, and about 40 watts output on 6 metres.

The prototype for the Hardrock-50 was a winner in a design contest sponsored by the ARRL in 2010. The much-evolved production version, now called the HR-50, is FCC “type accepted” and meets all legal requirements for amateur band operation.

Reviews of the HR-50 were excellent, and the documentation on the Hobby PCB website showed that the assembly and operation manuals were complete and well-designed, and reminiscent of the classic “Heathkit” manuals of the 1950s-1990s. It looked like a good solution to my needs.

Purchase

At US\$299, the price for the kit met my budget, so in late January I “took the plunge” and ordered the amplifier kit. I ordered the optional full break-in (QSK) board as a US\$30 option, but decided against the internal automatic antenna tuner (a US\$179 option) as I already own a nice external auto-tuner from LDG. I planned to use that with the new amplifier.

The kit arrived in a few days. The parts were all of good quality, and the kit was organized into sub-packs of parts for each main component of the assembly process (front panel; back panel; main PCB, et cetera).

Assembly

I downloaded the HR-50 assembly manual to my iPad and followed it step-by-step. The manual is well-written and clear. There are three PCBs provided: for the front panel, the back panel, and the larger main PCB. My kit contained a fourth PCB for the optional QSK board. All the PCBs come pre-populated with the key surface mount components such as

the microprocessors which control the amplifier. The PCBs are manufactured off-shore but quality is good. No SMD soldering is required.

Assembly starts with the front panel and works through the back panel, the main PCB, and lastly, the QSK board for those customers who have purchased this option. Assembly consists of inserting and soldering through-hole devices such as the four MOSFET power transistors, band switching relays, connectors, and headers and short jumper cables which link the amplifier’s boards together.

The optional QSK board is installed above the main PCB through provided headers and nylon spacers. Hardware is of excellent quality (stainless steel) and everything fit together perfectly.

Assembly was straightforward and I encountered only a few issues with the assembly steps. For example, in one step in assembly of the main PCB, I failed to read the step to the very end, and unfortunately installed two 2-pin terminal blocks which were NOT required if one is installing the QSK board. I had to de-solder the two terminal blocks as they would mechanically interfere with the QSK board to be installed above. A minor inconvenience, and technically my error, as I should have read the step to the very end!

An amplifier is an analog device, so the main PCB contains about 15 toroidal inductors which are part of the different ham band filters. The ~1.5 cm cores and a generous supply of enameled wire are provided. Alternatively, a full set of pre-wound toroids is available as a kit option for US\$30.

I chose to wind my own toroids for the experience, as I had never wound smaller toroids such as these. The directions in the manual were clear and photographs of what the finished toroids should look like are included in the assembly manual, so I decided to do the winding myself. I thought that it would be a great opportunity to learn a new skill. See Figure 2 [on the next page].

Amplifier filter “Q” (and consequently, amplifier performance) is improved by taking care to wind quality toroids, so it is worth the time to complete these assembly steps properly. The turns need to be tightly wound and spaced evenly. Critical is proper counting of the turns through each core. The toroid winding steps took me about two hours.

The hardest part of winding the toroids is removal of the insulation from the wire ends. This can be accomplished either by scraping (Exacto knife or Dremel tool) or via application of heat from a soldering iron. I used a combination of the soldering iron method and scraping with an Exacto knife. This took a couple of hours, but I got it done. After building the kit, I discovered a great tool for stripping enameled wire³. It’s designed for this purpose and works really well. I ordered one for US\$14 on Amazon and would definitely recommend using one, as it makes stripping the enameled wire quick and easy!

Three small transformers must also be wound using supplied wire, but these were straightforward once I had completed the big toroid winding job.

The kit includes a large extruded aluminum heatsink to dissipate heat from the four power MOSFETs. This serves also as the chassis for the entire amplifier. The main PCB is secured to the heatsink, and the front and back panels are bolted to the ends of the heatsink. The four MOSFETs and a helpful temperature sensor are also mechanically attached to the heatsink. The provided aluminum cover then integrates everything into a nice-looking device, as can be seen in the attached photos of my amplifier.

After about ten hours of (fun) work over three days, my amplifier was complete and ready for alignment and testing. See Figure 3 [right].

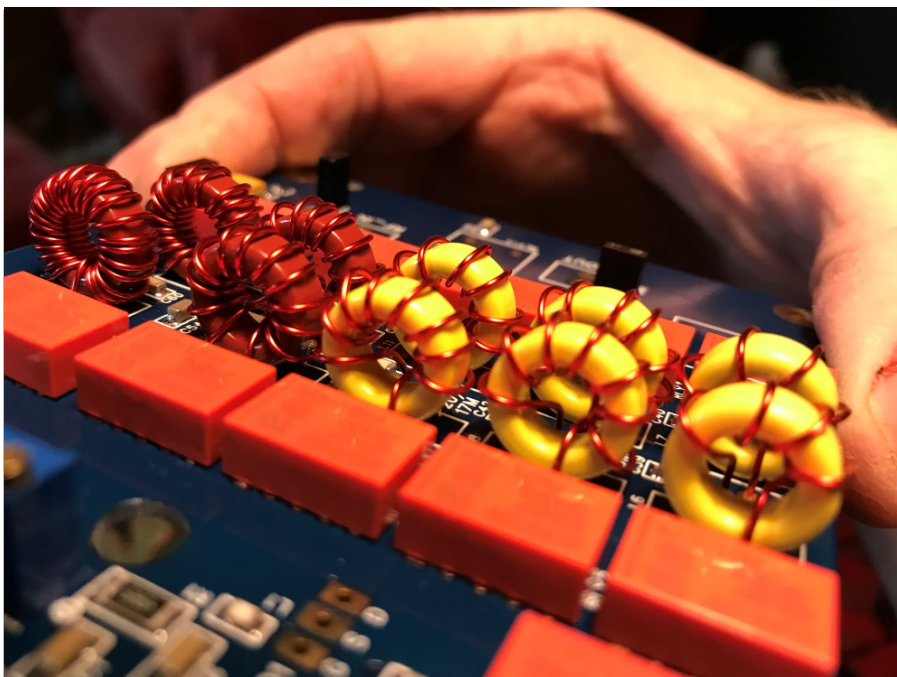


Figure 2- My Toroids Wound and Installed on the Main PCB

Alignment

Alignment of the HR-50 requires a 13.8 VDC power supply capable of about 10 amps, a small screwdriver and an ammeter such as available on common DMMs. The process consists of setting zero-drive bias current on the four MOSFETs.

This was a straightforward process and my new amplifier tuned up easily and quickly.

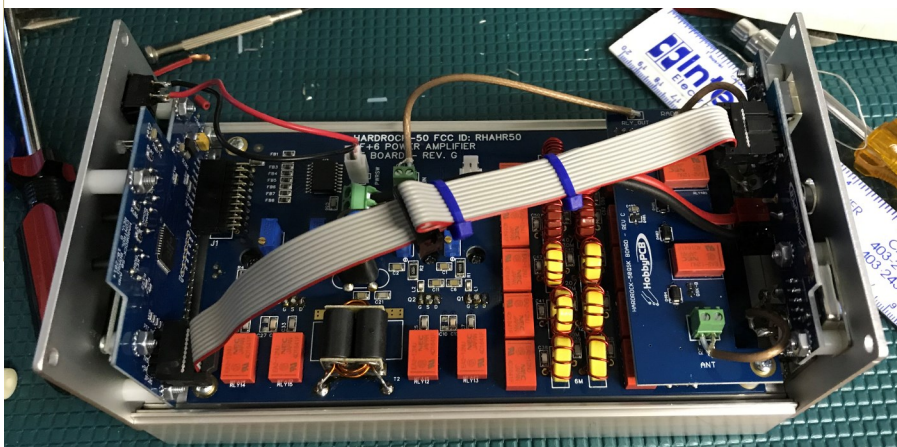


Figure 3 - My Amplifier at End of Assembly

March 2019

Testing

Next came the moment of truth! I connected the amplifier RF input to my KX3, and the amplifier output to a good quality dummy load. For the automatic control signals, I connected my KX3's control output signals and serial port to the amplifier through a small KX3 interface board that I bought from Hobby PCB as a US\$30 option.

I could have made my own (simple) control cable but chose the easy route in this case! Cable pinouts are provided in the assembly manual for those who want to "roll their own" interface cable.

Three settings on the KX3 had to be changed to set the inter-device baud rate and route PTT to the HR-50. Similarly, three settings had to be set on the HR-50s control menus. Then, I was ready to go!

"First Light"

First, I wanted to confirm that the HR-50 was receiving band change information from my KX3. I reduced my KX3's output power to 0 watts and cycled up and down through the amateur bands on my KX3. The HR-50 received the band change data and nicely tracked band changes.

Next came a test of amplifier performance. I keyed the transmitter (still into the dummy load) and increased power to 0.5 watts. The HR-50 was working! I cycled through the bands and noted that power output was working well. On

some bands, for example, I could easily exceed 50 watts output with only 2 to 3 watts of drive. I was suitably impressed!

On other bands, notably 20 and 80 metres, however, I noted that the HR-50's output was strangely low. What could be the cause?

Human Error

I'm as human as the next guy, and this section describes how I resolved this odd "low power on some bands" anomaly.

I investigated the low power situation, particularly on 20 metres, for a few days without resolution. I suspected that perhaps I had made an error in winding one of the toroids. I emailed Hobby PCB with a few questions and was honestly surprised when I got an email back from the amplifier's inventor, Jim Veatch (W2EIJ) within an hour.

Jim was very supportive and gave me some suggestions for testing. He reminded me early that "Hobby PCB guarantees a working amplifier for every customer", and that if we could not resolve the problem, that I could simply ship my HR-50 to him and that he would personally find the problem and fix it himself. Impressive customer service!

I did some troubleshooting using Jim's suggestions, and the HR-50 seemed to be "normal" in all respects. Very odd; I pondered this overnight.



Figure 4 -
The HR-50 At
My Operating
Position

The next morning, I decided to go “back to basics” and troubleshoot from the KX3 outward. I put a wattmeter on the KX3’s output - something that I had not done before as I was relying on the rig’s internal (more accurate) digital wattmeter.

I noted that on 20 and 80 metres (the bands with the lowest HR-50 output) that even if I set my KX3 to read 5 watts on its internal wattmeter, that my external meter only read about 1 watt output. How could this be? The rig was almost new. Had I “blown the finals”, as we used to say in the old tube-based rig days?

Then, a glance at the KX3’s display caused something to “twig”: the KX3’s internal ATU was still on! The KX3 had previously been used with my non-resonant-on-20-and-80 longwire antenna and still assumed that it was feeding that antenna, not the amplifier. The rig was now connected to the (resonant) HR-50. Eureka!

I disabled the KX3’s ATU, and the external wattmeter now showed 5 watts output on each band. The HR-50’s output into the dummy load jumped to what it should be, 50 watts+ on 160 through 10, and 40 - 50 watts on 6 metres. I was in business! See Figure 4 [page 20].

Performance

I hit the bands with my longwire and noted vastly improved reception of my signal by both NA and DX stations. The option to run up to 50 watts is great and has allowed me to make many more contacts that I could with 3 (maximum 5) watts digital on my “barefoot” KX3.

Now, about three weeks in, the HR-50 continues to perform perfectly. The front panel user interface is easy to use, and the amplifier tracks band changes automatically.

Also appreciated is the fact that the amplifier is unaffected by high SWR at the antenna connector. An open circuit, or even a dead short at the antenna terminal will not damage the MOSFETs. Of course, I have not made either of these errors, but it is nice to know that the finals cannot be “blown”, like in the “olden days”!

The heatsink gets quite hot using digital modes like FT8 with its 50-percent duty cycle, and heatsink temperature can reach 50 to 60 degrees Celsius. However, these heatsink temperatures are within the amplifier’s “normal” range, and the HR-50 operating manual says that external cooling should only be considered if the heatsink temperature goes above 90 degrees C. This is unlikely, in my experience.

The QSK board in the amplifier also works well and provides silent and extremely fast T/R switching, including “inter-dit” reception when using CW.

Conclusion

For my station and operating profile, the Hardrock-50 was a great investment. The kit is professionally designed and well documented, the amplifier works as specified, and it is backed by excellent support. Assembly was straightforward and fun, and I learned something about winding toroids. I will also not forget to turn off my KX3’s ATU when I return from portable to base operation!

I am extremely happy with the HR-50 kit and would highly recommend it to anyone running QRP and looking for a moderate boost in output power.

That’s it for this review. Please feel free to send comments and questions to me at mcquiggi@sfu.ca.

73 and see you on FT8.

~ Kevin VE7ZD/K7MCQ

¹ <https://hobbypcb.com/products/hf-radio/hardrock-50-hf-power-amp>

² Output power depends a bit on the quality of the construction provided by the kit-builder. Follow the instructions closely and your output will probably exceed 50 watts on all bands. Maximum rated output, though, is 50 watts, so don’t exceed this without risk of damage to the final power transistors! My amplifier reaches 50 watts output with only 2-3 watts input.

³ “Knipex 1511120 Coated-Wire Stripping Tweezers” on <https://amazon.com>

March 2019

Radio-Active

Les Tocko VA7OM

Profiles of SARC Members

Les Tocko (now VA7OM) the oldest of 3 brothers, was born in Slovakia, part of the former Czechoslovakia.

Many of us know Les from his enthusiastic support of foxhunting (aka radio direction finding or RDF) and his innovative designs of 80m foxhunt receiver kits which many of us built. As described below, we learn that there is much more to this man of diverse skills than foxhunting - since joining SARC in 2018 he has become an active member, contributing to many contest and club activities and public service events. Les also shares his talents with the Maple Ridge and Orca Clubs of which he is a member

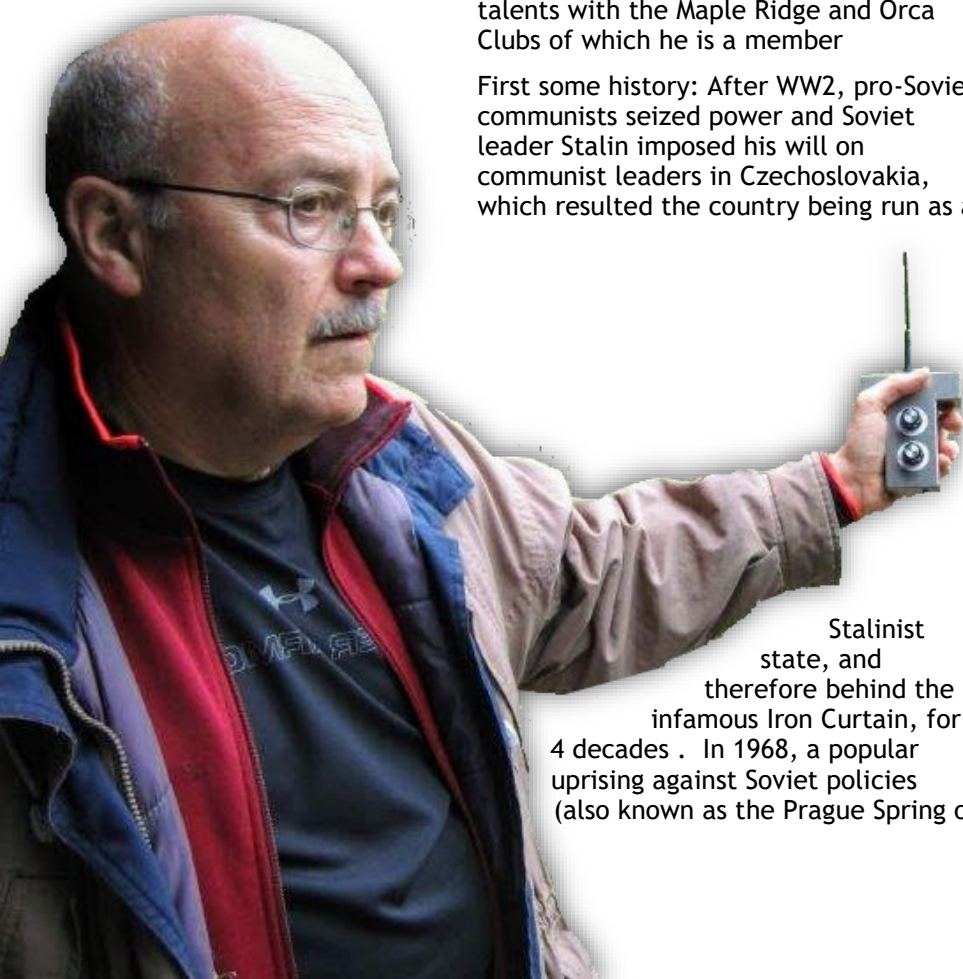
First some history: After WW2, pro-Soviet communists seized power and Soviet leader Stalin imposed his will on communist leaders in Czechoslovakia, which resulted the country being run as a

1968) was crushed when the Soviet Union and Warsaw Pact countries sent 2000 tanks and half million troops to invade the country. The Soviet Union then occupied the country and the Communist rule lasted another 21 years until it finally peacefully collapsed in 1989.

While in elementary school Les became interested in radio and built his first crystal radio and 1-tube receiver. In 1966 he joined a local radio club (OK3KTP) and participated in his first fox hunt. Later he joined the University radio club (OK3KAG) and qualified for his own license and call sign (OK3ZAX). In Europe, foxhunting is a very popular sport, so Les competed in many local, national and international fox hunts. His greatest foxhunt achievements were first place finishes in National and European competitions.

In Europe, most field days are VHF/UHF so the radio clubs attempt to work from mountain tops where line-of-sight works to best advantage. On one occasion, his fellow club members (OK3KAG), after climbing a 1200 ft mountain to set up antennas and equipment, found that they were without liquid refreshments - so Les was sent on the run back down the mountain to the nearest village to fetch some rum, then back up to the top of the mountain again at full speed. Les admits he was in better physical shape in those days and would not attempt it now but the experience attests to his dedication when something of great importance is involved.

Les graduated from technical college in 1967, followed by the University of



Stalinist state, and therefore behind the infamous Iron Curtain, for 4 decades. In 1968, a popular uprising against Soviet policies (also known as the Prague Spring of

Kosice (Slovak name : "Vysoka Skola Technicka Kosice, Elektrotechnicka Fakulta) where he obtained his degree in Electrical Engineering 1973. Later, when in Canada, he was required to pass more exams to confirm eligibility as a Professional Engineer (P.Eng) in Manitoba, Alberta and BC. This was a major challenge as English was not his native language.

Les met his future wife, Sonia, in 1973 in Slovakia and they were married in 1974. When asked how he met Sonia, Les tells us this story: "After I graduated from university I went camping with my dog, a German shepherd. I met her there and she liked to take the dog for walks. I am not sure if she liked the dog or me but at the end it worked out."

In 1981, Les and Sonia moved to Canada because they were fed up with the Communist domination and wanted to make a new start (Les also confesses that part of the reason for the move was that he was unable to get the radio parts he needed). Still happily married, Les and Sonia celebrated their 45th anniversary in January this year.

In Slovakia Les worked for a telecom company (similar to Telus). After emigrating to Canada, he was employed by the City of Winnipeg (emergency communications department), then by Alberta Power in Edmonton and later by Honeywell in Cloverdale, BC.

In retirement since 2013, Les now has more time for travel (favourite destination is Mexico), camping, hiking, gardening and ham radio. DXing and contesting as well as design and construction of receivers, amplifiers and other electronics are aspects of amateur radio that give Les the greatest hobby enjoyment. His current project is construction of a high power triplexer and bandpass filters for use by SARC. Les says that so far his most satisfying home-built projects have been two linear amplifiers and 2 generations of 80m foxhunt receivers, as shown in the photos.

We most sincerely appreciate Les's keen interest in promoting amateur radio, his friendly nature, his expertise and his positive contributions to the hobby, all of which have made SARC a more well-rounded organization.

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First generation (above left) and second generation (above right and right) of fox hunting receivers.

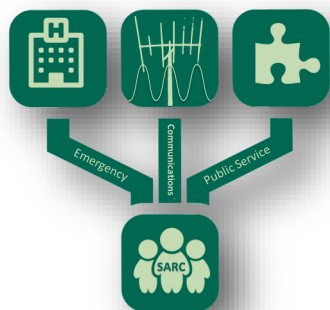


The photo below right shows the home-brew 80-10m tube-type full power amplifier and left the home-brew all band 250 W solid state amplifier with control box for the full power unit below it.



Les VA7OM at his home station.

March 2019



Public Service

Amateur Radio Serving The City Of Surrey

Public Service Principles

Public Service Report

Don Hamilton VA7GL



Don't you think that one of the main things we now have to deal with in the ham community is change. Change seems to be the hard lesson that challenges us with each new concept or piece of hardware that invades our lives.

Each decision to change should be evaluated to see exactly how it will affect our lives. If not, you could be caught with a Beta Tape system.

I'm hoping that over the next couple of months we will be able to work together to understand the proposed Public Service changes and how they will affect all of us. By the way, it's not the concepts of change that is the challenge. Remember that change is not right or wrong, it just is. It's our lot to figure out how to deal with the changes that we are presented with. We are starting to see some of these changes in action with more focus being put on Public Service and Emergency communications.

So, we think it's time to take a hard look at our investment in equipment and time commitment to see that our precious resources are making the best possible investments in the future. This is why we are working to keep the Surrey Amateur Radio Communication members be on the leading edge of our hobby. To make this happen we are trying to facilitate programs that teach new hams the basics. Have a group station where we can hone our communication skill. Being able to support

our City in time of need with our equipment and knowledge.

SDR transceivers have forever changed ham radio hardware. With these constant changes of these complex systems make it very difficult to manage. SDR's also require constant software updates. Now we also have a huge reliance the manufacture to insure the products reliability and stability, plus giving increased performance and usability. I use this as an example of the frustrations we can have with these new devices that require a stable power supply and the internet. The good news, so far, the power outages and internet failures are usually in small areas.

The reason I bring this up is because in order for us to be able to assist people in our community we must first be able to look after ourselves and our families. We must have a surplus on hand if that is needed in an emergency. So, this is the reason for the renewed focus on Public service and emergency communications.

~ Don VA7GL

SEPAR Report

Gord Kirk VA7GK

It has been a busy few months since I have stepped in as the SEPAR Coordinator. In fact it has also become busier for the entire executive team of SEPARS. I have been asking lots of questions, asking for old records and data, ensuring net controllers



are still managing nets etc. The executive have been active to ensure the good work of SEPAR continues. We have met as an Executive team for SEPARS and also met with SARC executive as we plan for the future.

For many months there has been ongoing planning regarding the actual society and what the future might look like. Both the SEPARS and SARC Executives are committed to maintaining and growing the emergency communications functions as part of the Surrey Emergency Program managed by the Surrey Fire Department.

Surrey Fire Service is responsible for Emergency planning and coordination of the various volunteer groups that support the city. As I have met with them they are fully supportive of Amateur Radio Community and the Volunteer work we provide to the city. As we have discussed various opportunities they have been very supportive.

Recently a small group met with the Surrey Neighbourhood Emergency Preparedness Program (NEPP) to discuss ways that amateur radio might meet communications challenges within various neighbourhoods. As the NEPP materials for presentations to the community are renewed the opportunity to explain Amateur radio and how it can be used in emergencies can be presented.

SEPARS and the SARC Public Service Committee are working to create joint opportunities to practice and demonstrate emergency communications using Amateur Radio.

At this time the following dates are being organized. Please mark these dates in your calendars and plan to help assist with these events.

Upcoming SEPAR Calendar Dates

Please mark you calendars to attend these upcoming SEPAR activities. Further specific details will follow.

- March 2, 2019 Saturday 09:30-12:00 Surrey Fire Training Centre. SEPAR Event- We will be reviewing the Grab and Go Kits as well as completing an inventory to ensure the kits are complete and in good working order.
- April 13-14, 2019 Seattle Communications Academy. Some of the SEPAR members may be attending the weekend with a focus on "Communications Response to Catastrophic Events". This event is in Seattle and those attending will need to do so at their own expense.
<http://commacademy.org>
- June 8 2019 Saturday 11:00 - 4:00pm Surrey Doors Open. SEPAR will participate with this event promoting Emergency Program work in Surrey with Amateur Radio. The OTC will be open to send messages to a potential second site. Both SEPARS and SARC will support this great opportunity to demonstrate the value of Amateur Radio in our community.
- June 22-23, 2019 Field Day. Once again SEPAR will support 2019 Field Day. Work with the SARC Field Day committee is underway to plan this weekend event.
- July 1, 2019 Canada Day Bill Reid Amphitheatre Grounds. SEPAR will again request to set up with the other Surrey Emergency Programs at the Canada Day Celebration to promote both SEPAR and the other Emergency Programs to the public.

Name	Frequency	Offset	CTCSS
VE7RSC (Primary Repeater)	147.360	+0.600	110.9
VE7RSC (Secondary Repeater)	443.775	+5.0	110.9
VE7RPT (Primary Regional Repeater)	146.940	-0.600	
Optional	136.5	Rcve	
Simplex 1	(VHF)	146.550	
Simplex 2	(VHF)	147.420	
Simplex 3	(UHF)	446.550	
Simplex 4	(UHF)	447.425	
Other frequencies in the Greater Vancouver area:			
Primary: Coquitlam/Abbotsford		146.430	
Primary: Inter-Municipal Group 3		146.445	
Primary: Vancouver; Mission; Sec. Coquitlam		146.460	
Primary: Kent-Mission; Sec. Richmond		146.475	
Primary: Inter-Municipal Group 2		146.490	
Primary: New West; Sec. Richmond		146.505	
National Calling / FM Simplex Group I		146.520	
Primary: North Shore; Port Coquitlam		146.535	
Primary: Bowen Island; Surrey		146.550	
Intermunicipal Group 1 Coordination		146.565	
Primary: Lions Bay/Vancouver/Delta/Langley		146.580	
Primary: Port Moody; Sec. Burnaby		146.595	
Secondary: Vancouver/Surrey		147.420	
Secondary: Vancouver (UBC) / Maple Ridge		147.450	
Primary: White Rock/Chilliwack; Sec. No. Shore		147.480	
Secondary: Burnaby/Pitt Meadows		147.510	
Primary: Delta; Sec. Abbotsford		147.540	
Primary: Hope; Sec. Delta; ALSO EMBC		147.570	

~ Gord VA7GK
SEPAR Coordinator

March 2019



Emergency Comms

Jim Andrews, KH6HTV

Amateur Television

Fig. 1 A complete 70cm, 3 Watt, high-definition, digital TV Transmitter. It consists of a Canon camcorder, a Hi-Des model HV-100EH modulator and a KH6HTV Video model 70-7B linear rf power amplifier.



Have you ever considered adding Amateur Television (ATV) to your various club amateur radio activities? ATV has come a long way in recent years. Many ATV hams both in the USA and world-wide have moved into the 21st century with digital TV (DTV). Weak, snowy pictures, complete with ghosts are now a thing of the past. Today's DATV hams are now transmitting, perfect, high-definition (1080P), live pictures with CD quality audio. They are doing it with equipment costing no more than an entry level HF rig. Live (not slow-scan) TV requires a lot of bandwidth. Thus it is only done on the 70cm band and higher microwave bands. The 70cm band is the most popular and has the typical UHF propagation characteristics. The 23cm band is the second most popular band for ATV.

There is also a growing number of DATV repeaters for extending the reach of their TV signals. There is even an linked network of eleven ATV repeaters in southern California, Nevada and Arizona (www.atn-tv.org). Internet streaming video from ATV repeaters around the world can be viewed on the British Amateur Television Club's web site (<https://batc.org.uk/live/>)

Amateur TV, also called ATV, is an often overlooked communication mode which radio amateurs can offer in times of emergencies to our public safety agencies. RACES and ARES groups should strongly consider using ATV in addition to the more traditional radio services. In Boulder, Colorado, the local ARES group (BCARES) has been providing ATV for almost 30 years now. It is the most



Fig. 2 BCARES live video feed on 70cm from mountain top to Boulder 911-EOC of slurry bomber fighting the Four Mile Canyon forest fire.

often requested BCARES service, far exceeding HF, VHF or UHF voice radio or packet radio. BCARES gets called several times a year by the Sheriff, Police and Fire depts. to provide ATV coverage of events ranging from forest fires, floods, political demonstrations, protest rallies, riots, SWAT operations, university football games, campus visits by VIPs, and large (50,000 runners) 10K races.

When BCARES initially started in 1991 with ATV, a single TV camera image was provided. It proved so popular with the police command staff, that they soon asked for even more cameras. This was first done on a single, 70cm, channel by switching on and off separate TV transmitters. Soon the police asked to see all the cameras at the same time. BCARES then drew the line at four cameras as we had run out of available 6 MHz channels in the popular 70cm band. BCARES used channels 57, 58, 59 and 60. This was a technical challenge to accomplish on four adjacent channels without co-channel interference. BCARES was then using AM-TV transmitters with an inter-digital, 6 MHz, band-pass filter on the output of each transmitter to produce VUSB-TV. BCARES also used identical channel filters on the inputs to each receiver. Initially, we provided the images on four separate TV receiver/monitors. However, these took up too much space in the command post. The next improvement was to build a Quad TV Receiver box. Four separate, commercial grade, cable TV head-end receivers were used. The composite video outputs from these CATV receivers were then fed into a quad processor which combined the four video inputs into a single composite video signal with each image displayed in one of the four quadrants on a single video monitor screen. When desired, with the push of a button, a single image could be selected and displayed in full screen mode. This analog system was used successfully for many years by BCARES. In 2015, BCARES transitioned over completely to DTV, including assembling a new hi-definition, DTV quad receiver. They also added IP streaming capability to their receiver.

BCARES has its own ATV equipment which it stores in the Boulder County EOC/911 dispatch center for immediate 24/7 access. It also has TV receiving stations set up in the county EOC, police stations and also in police mobile command vehicles. For portable field operations, it uses a small, ATV transmitter, transported in a back pack, along with a camcorder, tripod, whip antenna and battery. The whip antennas are mounted along



Fig. 3 Dave, K10HG & Mark, KBOLRS, BCARES TV net control in the University of Colorado police chief's command post receiving four simultaneous, TV signals on channels 57-60 (70cm), from BCARES portable TV cameras/transmitters.

with the camcorder on the camera tripod. This maximizes their radiation efficiency. The DVB-T transmitters used are the same as shown in Fig. 1. Using a lithium battery, the camera and transmitter can be run for many hours at 100% duty cycle. BCARES has access to a TV repeater which covers the eastern, prairie half of the county. It also has a portable ATV repeater in its equipment cache for use in the mountainous western half of the county. BCARES certainly serves as a role model for other ARES/RACES groups showing what can be accomplished with ATV for public safety.

If you are interested in learning more about ATV, I have a web site with a lot of application notes on ATV, both analog and digital. It is:

www.kh6htv.com Recommended reading is my newest addition, AN-45, a free, on-line, book entitled "Introduction to Amateur Digital Television". It pulls together in one place information scattered elsewhere in my over forty application notes. Plus, if you have any further questions, please do not hesitate to contact me via e-mail at kh6htv@arll.net.

~ Jim Andrews, KH6HTV

March 2019



KB6NU's Column

Dan Romanchik, KB6NU

Operating Notes

When he's not trying to figure out which way current flows, Dan blogs about amateur radio at KB6NU.com, teaches ham radio classes, and operates CW on the HF bands. Look for him on 30m, 40m, and 80m. You can email him at cwgeek@kb6nu.com.

Operating Notes: Finding CQers on the IC-7300, CW abbreviations, indoor Buddipole

Finding stations calling CQ can be a hit or miss affair. Think about it. If you're using a conventional receiver, you have to hear the station calling just as you tune across the frequency and recognize the signal as a CQ. If you tune across the frequency while the station is waiting for a reply, you miss the CQ entirely.

This situation is exacerbated by the increased use of sharp filters. If you're using a filter with a bandwidth of 500 Hz or less, you have even less chance of hearing a CQ. Back when receivers selectivity was as broad as the side of a barn, you'd hear several stations at once. While that may not have been ideal for working a particular station, it made finding stations calling CQ easier.

Well, with the IC-7300, you can have your cake and eat it, too. Let me explain.

Last night, I was calling CQ on 7028 kHz and wasn't having much luck. In the middle of one call, I see a signal pop up on 7029. I couldn't hear it, but I could see it. I tuned over to 7029, and sure enough, it was someone calling CQ. I replied, and we had a nice contact.

After using the bandscope for a while, you get to recognize signals that may be stations calling CQ. The trace on the waterfall last for about five seconds, and you don't see any other station on that frequency. I guess that

this technique may not work so well on 20m and higher, but on 40m and 80m, where you can generally hear both stations in a contact, it works quite well.

One thing that perplexes me a little is that CW operators seem to be using abbreviations less and less. The other day, for example, I was working a guy who seemed determined not to use abbreviations at all. He spelled out "Michigan," for example, instead of simply sending "MI."

Using abbreviations really is good operating practice. It allows you to say more in less time, and in the end, makes operating CW more fun. It's not hard to learn the most common abbreviations, and using them appropriately says to me that you're a good CW op.

Yesterday, I was working a guy in Boston who said that he was using an indoor vertical. I was kind of intrigued, so I asked him to describe it in a little more detail.

As it turns out, he was using a Buddipole (technically a Buddistick, since he was using it as a vertical). The counterpoise, he said, was coiled underneath a bed.

The signals weren't that great, and there was a lot of fading, but he was able to get on the air, and isn't that what it's all about?

~ Dan KB6NU
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Signalink Interface Issues?

I have two Signalink USB interfaces (one here and one at the museum), and to be honest, I never was really happy with them. I kept hearing about how PSK31 was supposed to be so great at digging weak signals out of the mud, but I never seemed to get that kind of performance with the Signalinks.

Shortly after I bought the cable and jumper to use the Signalink with the KX3-I've discovered that there are noise problems with them, or at least some of them. Not only that, they're not stereo, so while they work fine for most ham digital modes, they won't work for SDR work, i.e. connecting the I/Q outputs of the KX3 to a computer.

Walt, K6WRU recommends reading this article [by K9YC](#) on USB interfaces. He's a pretty smart guy, and if he recommends reading it, then it's probably worth reading. In this article, K9YC says, "I view specialized 'do everything' ham interfaces as overly complicated to set up and over-priced. Some have interconnect cables that look like an invitation to RFI. If you're using VOX to key the radio, all you need for digital modes is one of these USB [sound cards]."

I haven't tried another sound card yet, but at some point, I probably will purchase one of the sound cards [mentioned on the Telepost website](#). Telepost is run by Larry, N8LP, who lives in Plymouth, MI. I know him, and he's also a very smart guy and knows a lot about this stuff. One of the things he sells is a panadapter for the Elecraft radios (read: accepts I/Q input).

One of the sound cards he mentions is the [Syba USB 2.0 External Stereo Sound Card Adapter](#) with Optical SPDIF Output SD-AUD20101. It costs only US\$12! Of course, you have to make up some cables to use it, but even so, you'll end up saving some money over the Signalink.

One of the sound cards that the KX3 mailing list, K9YC, and N8LP all seem to like is the [ASUS Xonar U5 Sound Card](#). Amazon sells it for US\$70. It has a 192 kHz sampling rate and 24-bit resolution. I'm not sure what these specifications are for the Signalink, but I'm guessing that they're not as good.

So, why is the Signalink so popular? Well, for one thing, it's a plug and play solution. You can purchase a header and jumper that you just plug into the Signalink and the rig, and you're up and running. When using one of these other sound cards, you'll have to purchase the connectors and make up the appropriate cables yourself. Overall, it seems like it's worth it, though.

INVENTOR FINDS WAY TO KEEP WIRELESS CLEAR

Roy A. Weagant of Marconi
Company Removes Static
Interference.

General Manager Says Col-
league Has Perfected Mar-
coni's Discovery.

OFFERED IT TO GOVERNMENT

Continuous Service During 24 Hours
Is Assured and High Towers
Are No Longer Necessary.

Roy A. Weagant, chief engineer of the Marconi Wireless Telegraph Company of America, it was announced yesterday, has perfected an invention which has taken the "static" out of wireless telegraphy, thereby removing the greatest obstacle to the clear transmission of radio messages. "Static" is the presence in the air of a large amount of uncontrolled electricity. It often, and for considerable periods of time, made it impossible to send wireless messages, because the operator at the receiving end could make nothing out of what was being sent. "Static" to wireless telegraphy was what the old buzzing used to be on a long-distance telephone wire, making it impossible for the receiver to hear anything but the buzz.

So important is the invention regarded that Edward J. Nally, Vice President and General Manager of the Marconi Wireless Telegraph Company of America, said yesterday that, with the exception of the operation of any number of high-power stations, and it reduces the amount of power heretofore required to operate a wireless station by about one-half, making possible a saving of 60 per cent. in fuel. The official announcement of the invention was made for the company by Mr. Nally yesterday afternoon and reads as follows:

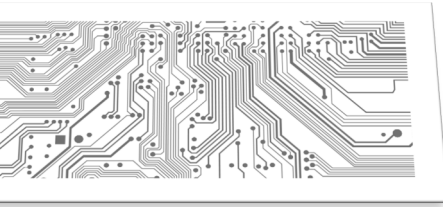
Static Interference Ended.

With the conditions that pledged us to absolute secrecy no longer prevailing, the Marconi Wireless Telegraph Company of America is permitted to announce a discovery and invention in wireless telegraphy that will mark a new era in world communication. It is America's contribution to science in solving a problem that has engaged the best scientific minds of the world. Ever since the genius of Marconi made wireless telegraphy a fact, the only limitation of this method of communication was the deadly phenomena of "static conditions." It was "static"—the presence of a large amount of uncontrolled electricity in the air—that at the beginning of the war often entirely prostrated the wireless service even between the most powerful stations erected in Europe and America. Static conditions were responsible for abnormal delays and for the mutilation of words in wireless messages.

It was the one great obstacle to continuous communication by means of electro-magnetic waves in the air. So baffling was the problem that Marconi issued a personal appeal to every wireless operator in the world to record his observations and to collect data on the subject. Some of the leading scientific minds in the universe struggled to overcome the effects of the static disturbances. World-wide researches were instituted and large sums of money expended, but the end sought was not obtained.

It remained for an American radio expert, Roy A. Weagant, Chief Engineer of the Marconi Wireless Telegraph Company of America, to discover the solution of the static problem. Weagant practically had devoted his life to a study of this perplexing phenomenon, and the result of fifteen years of experimental work was about to be published to the world when the United States entered the war. Although patent applications had been made and the claims allowed by the United States Patent Office, the Weagant system was immediately placed at the disposal of the American Government, and every precaution was taken to keep the invention secret until the discovery could be safely announced. With the spirit of research that has made the navy such a magnificent arm of our military service, officials of the Navy Department as-

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TECH TOPICS

An Arduino APRS Tracker

An APRS tracker is easy to build these days. The author decided to build one for portable use (the plan was for it to be used for hiking, but also in the car) powered from a Lithium Ion battery and with all components on 3.3V. Transmit of APRS messages done through a Baofeng UV-5R.

The tracker is powered from a Panasonic NCR18650 3400mAh through a MCP1700-3302E LDO regulator, which provides plenty of juice for daily use. The GPS is an Adafruit Ultimate GPS Breakout - 66 channel w/10 Hz updates Not that he needed 10 Hz, as a 1 Hz update is more than enough, but he had one in stock from a different project, so why not?

(<https://www.adafruit.com/product/746>)

The Arduino is a Pro Mini 3.3V 8 MHz (actually a clone of a Deek-Robot Pro Mini)

<http://www.billy.gr/arduino-aprs-tracker/2/12>

Up and running

The author bought a Kenwood cable to avoid the mess soldering the 2.5 and 3.5 mm audio connectors:

<https://www.aliexpress.com/item/DIY-2-pin-4-Wire-Speaker-Mic-Cable-Spring-Line-for-Baofeng-UV5R-Kenwood-TK370-Linton/32734963747.html>

Remember that the power supply needs to be 3.3 Volts.

He also added a TP4056 Lithium Cell Charger Module with Battery Protection to charge it through USB:

https://www.aliexpress.com/store/product/5x-TP4056-Lithium-Charger-Module-with-Battery-Protection-Micro-USB-5V-1A-TE420/1895489_32646760134.html

The author started working with the schematic of the MicroModem (<http://unsigned.io>) but has modified LibAPRS.

How it works

As long as the GPS has a fix it submits a location every two minutes and there is a button for a single shot APRS update. The intent is to add SmartBeaconing support and a complete the unit with a DRA818V with USB charging. The DRA818V is still on my desk... I have "trouble" designing a good low pass filter for VHF.

<http://www.billy.gr/arduino-aprs-tracker/3/12>

I have uploaded my working version to github:

<https://github.com/billygr/arduino-aprs-tracker>

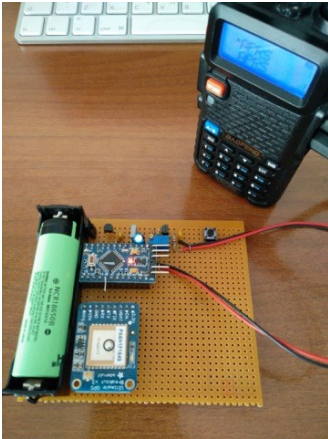
Remember to change the APRS_CALLSIGN to your call sign. You will need also these libraries:

libAPRS (modified) <https://github.com/billygr/LibAPRS>

TinyGPS <http://arduiniana.org/libraries/tinygps/>

SimpleTimer <https://github.com/jfturcot/SimpleTimer>



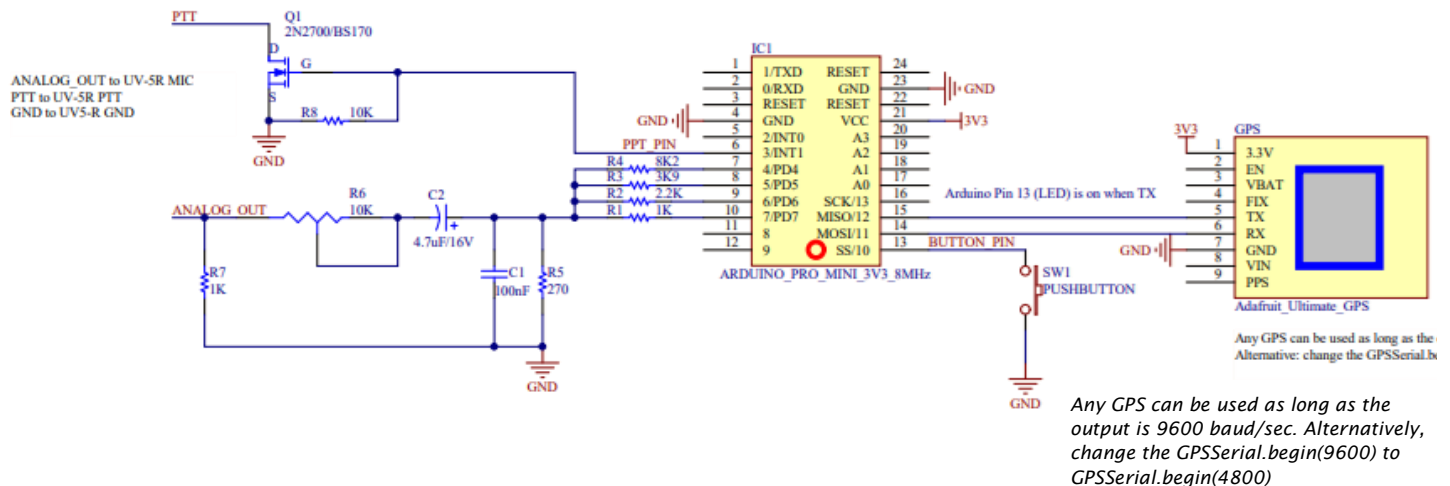


Bill of Materials

- R1 1K
- R2 2K2
- R3 3K9
- R4 8K2
- R5 270
- R6 10K trimmer
- R7 1K
- R8 10K
- C1 100nF
- C2 4.7uF/16V
- 1x GPS Module
- 1 x push button
- 1 x Arduino Pro Mini 3V3 8MHz
- Q1 2N2700/BS170
- For using without a an external power supply
- 1 x Panasonic NCR18650 3400mAH (or your favorite 18650)
- 1 x 18650 socket
- 1 x MCP1700-3302E

This is a quick, fun project that can be made quite useful for APRS.

~ Billy

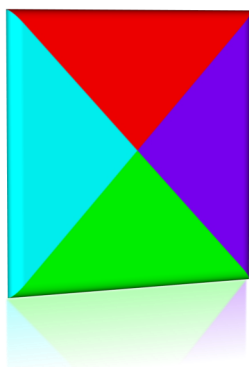


Virtual Serial Port Driver helps Amateur Radio operators

Let's have a look at the case study of a ham radio operator, who was looking for a way to establish communication between several applications working via a serial communication protocol. For that reason, the hero of this article was looking for a reliable solution to create virtual COM port pairs on Windows 10.

<https://goo.gl/cZpP4c>

March 2019



Foundations Of Amateur Radio

VK6FLAB Onno Benschop

Episode 193—Modern Tools for a Modern Hobby



*For the audio
podcast
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Amateur Radio
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[http://podcasts.itmaze.
com.au/](http://podcasts.itmaze.com.au/)*

The hobby we call amateur radio is enormous. One amateur called it a thousand hobbies in one and that just about sums it up for me. Being bored inside this hobby is not an option, because there is just so much to do and see.

Yesterday I found a completely unrelated aspect to our hobby, call it the one thousand and first hobby associated with amateur radio. A friend came over and handed me the separation kit mount for my Yaesu FT-857D, it's the bit of plastic that you clip to the back of the head of the radio, so you can mount it somewhere separate from the main body of the radio.

I have one of those already, purchased from a local supplier, at the time, 8 years ago, it cost me \$80, these days it's included with the radio. For my station I needed a second mount and I really didn't want to spend that much money on three cables and some plastic, so I went hunting for alternatives. One of my friends is doing some 3D printing R&D for his job and has access to a printer to do some rapid prototyping and I wondered if that might be an option.

Turns out that I'm late to the party, people have been designing and printing bits for their radios for years.

A quick hunt through the popular 3D printing libraries showed about 500 different designs for Yaesu, Elecraft, Baofeng, ICOM and Kenwood, though I should point out that Kenwood also makes food processors and other bits that seem

popular in the 3D printing world, so 500 is likely a little high, but respectable nonetheless.

I looked at 8 different libraries and found that Thingiverse is by far the most popular for bits with radio brands we know and love. It occurred to me that right here is the perfect example of how amateur radio is a hobby that just grows and grows.

If you're looking for radio mounts, stands, buttons, microphone clips, belt clips, mount adaptors, holders, cradles, plug covers, brackets, earpiece retainers, logos, callsign stands, cogs, gears, handles, caps, pins, latches, cases, tuning knobs, CW key brackets, stacking brackets, antenna adaptors, feet, desk stands, shoulder strap holders, battery compartments, you're good to go.

I should mention that you don't even need to invest in a 3D printer at this point, you can hand the design to a printing service and get your print shipped to you in the mail.

If you cannot find what you're looking for, you can fire up a 3D CAD program and get designing to make something precisely to your own specifications and based on the current tools available, you can even see what it's going to look like by the time it's rendered in the plastic and colour of your choice.

I've only mentioned radio bits, but there's nothing stopping you from printing ladder line separators, dipole centres, antenna brackets, tuner cases, project cases for

your home-brew contraption, knobs and dials, buttons and connectors and other missing parts or hard to find pieces.

If you're using standard components like a Raspberry Pi or Arduino, you'll find cases ready to go for those as well, so the more you look, the more you'll find.

The point of all this is that amateur radio is a hobby that goes far beyond someone sitting behind a radio listening to beeps, pops and crackles. Manufacturing and amateur radio go hand-in-hand and have done since the very beginning, but there's no rule that says that you have to keep using

traditional tools to build what you're imagining.

The sky is the limit, and based on the efforts of CAMRAS, the CA Muller Radio Astronomy Station, PI9CAM based at the Dwingeloo Radio Telescope in the Netherlands, who captured a photo of the far side of the moon using a camera linked to an amateur radio transceiver on board of the Chinese Longjiang-2 satellite, even that limit is being explored.

~ I'm Onno VK6FLAB

To listen to the podcast, visit the website: <http://podcasts.itmaze.com.au/foundations/> and scroll to the bottom for the latest episode. You can also use your podcast tool of choice and search for my callsign, VK6FLAB.

All podcast transcripts are collated and edited in an annual volume which you can find by searching for my callsign on your local Amazon store, or visit my author page: <http://amazon.com/author/owh>.

Foundations of Amateur Radio Volume 7 is out now - with chapters on digital modes, coax connector loss, waterfalls, station performance and more.

Feel free to get in touch directly via email: onno@itmaze.com.au, or follow on twitter: @vk6flab (<http://twitter.com/vk6flab/>)

If you'd like to join a weekly net for new and returning amateurs, check out the details at <http://ftroop.vk6.net>, the net runs every week on Saturday, from 00:00 to 01:00 UTC on Echolink, IRLP, AllStar Link and 2m FM via various repeaters.

ITmaze -ABN: 56 178 057 063

phone: 04 1219 8888
onno@itmaze.com.au



Episode 190—Are you an Elmer?

In our hobby there is a term "Elmer", referring to someone who helps new amateurs find their way inside the community, locate resources, understand techniques, etc. It's part of what we might consider the folklore of amateur radio.

I started this with the intent to quickly introduce the concept of an Elmer and then spend some time talking about our own role in this adventure, but as is often the case, I was side-tracked by my own investigation.

There is a push within the community to abandon the concept of an Elmer, that it's not real that it serves no purpose and that it's a recent invention and irrelevant to our community. Finding an Elmer today appears to be hard work, seeing the wood for the trees, finding a unicorn in this social media connected world. But as it turns out, Elmers are closer than you think.

With a little searching, the person who is credited with introducing the word Elmer into the amateur radio vocabulary

was Rod W9BRD. He was the author of a column "How's DX?" in QST magazine from 1947 through to 1978. In March of 1971 he wrote:

"[t]oo frequently one hears a sad story in this little nutshell: 'Oh, I almost got a ticket, too, but Elmer, W9XYZ, moved away and I kind of lost interest.' Sure, the guy could have burned through on his own, maybe, but he, like others, wound up an almost-ham. No more Elmer. We need those Elmers. All the Elmers, including the ham who took the most time and trouble to give you a push toward your license, are the birds who keep this great game young and fresh."

Rod was first licensed in 1937 as a 14 year old. He became a silent key in 2012.

On the face of it we have this idea that an Elmer is someone who helps you get your amateur license, but it started me thinking. What if Elmer wasn't a phrase, but a reference. The name Elmer is a male name from Old English, meaning "noble" and "famous". What if W9XYZ

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*As it turns out,
"Elmer" is all of us*

wasn't an actual callsign, but an example, given Rod was licensed as W9BRD, it would be simple to think of XYZ as a random suffix, much like I might use VK6XYZ, which happens to be a non-existent call at the moment.

What if Rod was saying: Oh, I almost got a ticket too, but Peter VK6LB, or Paul VK5PAS or Mary VK4PZ, moved away and I kind of lost interest.

Instead of using real amateurs like I just did, Rod wanted to use a generic name, someone "noble" and "famous", with a generic callsign to not single out a particular person.

The reference to "Elmer" takes on a whole different meaning. It means anyone, you, me, the amateur at your club, anyone who can help another person become an amateur.

As it turns out, "Elmer" is all of us, it's a way to refer to anyone and everyone, it's not a specific role or purpose, it's the invitation to you to help another amateur.

This of course means that you need to step-up. You don't need to put on your Elmer cape and become a superhero, you just need to be part of the community, to ask questions, to help with discovering answers and to encourage investigation into this exciting pursuit of amateur radio.

So, are you an Elmer and if not, what are you going to do about it?

~ So, for now, I'm Onno AX6FLAB

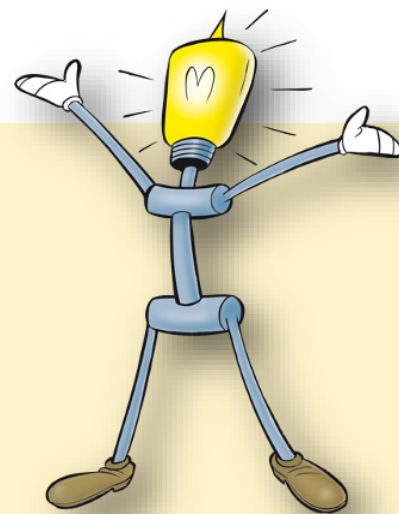
Better Crimp Connections?

The local radio club is opting to replace the ancient feedlines we use at Field Day. It looks like we will be going to RG-8X. I have crimped many connectors and have the proper tools to do so. I am looking for a way to make the connector attachment to the coax truly rugged! I have seen "manufactured" cables that have a strain relief where the cable and connector come together. Is there a way for the home user to do something similar?

Thanks and 73,
Gary KK0SD

Use thick-wall adhesive-lined (hot melt) heat shrink. Start with a long piece of the smallest diameter that will fit over the cable and crimp ferrule, with enough length for it to extend down the coax maybe 2" beyond the end of the ferrule when butted up against the body of the connector. Shrink that down. Then add another length of slightly-larger heatshrink over the first, cut maybe 1/2" shorter but still butted up to the connector body, and shrink that. Do a third that's 1/2" shorter than that. The built-up layers closest to the connector body will prevent sharp bending at the ferrule, and the fewer-layer staggered sections further up the cable will allow gentle flexing while maintaining strain relief.

Jeff WN3A





No-Ham Recipes

Microwave Sweet and Sour Pork

What would some of us do without the convenience of our microwave ovens? They do certain things very well and really save time. Did you know that if you have a rock-hard tub of ice-cream, you can zap it a few times on medium to medium high for about 5 to 8 seconds per zap?

This will soften it just enough to allow you to scoop it out. Use care-don't run the oven for too long or the plastic coating on the paper or the plastic tub will get very hot and release toxic fumes into both your ice cream and the air you breathe. And then your ice cream will be unbearably runny. You're poisoned and your ice cream isn't worth eating... Yikes! What a bad day, especially if you were trying to get your sweets fix for the day!

Muriel finds that this recipe doubles and freezes well.

- 1½ pounds (675 grams) cubed pork (fat removed)
- 2 tablespoons (30 ml) corn starch
- 3 tablespoons (45 ml) soy sauce
- ¼ cup (65 ml) packed brown sugar

- ¼ teaspoon (1.25 ml) ginger
- ¼ cup (65 ml) vinegar
- ¼ cup (65 ml) ketchup
- ⅓ cup (90 ml) water
- 13 ounce (390 ml) can pineapple chunks plus juice
- 1 small onion, sliced thinly
- 1 medium green pepper, sliced thinly (optional)

In a 2 quart (2 litre) casserole, toss pork with cornstarch. Mix in remaining ingredients except green pepper. Cook, covered for 6 minutes on high setting. Stir mixture and then cook at defrost setting for 8 minutes, or until meat is done, stirring occasionally. Stir in green pepper and cook 1 minute. Let stand for 10 minutes.

Makes 4 to 6 servings.

~ Muriel Foisy VE7LQH



Social Reminder

The Surrey weekly social gathering is on Saturday at the Kalmar Restaurant at 80th and King George Boulevard between 8 and 10:00 am. You don't have to be a SARC member to participate. Bring your significant other, bring your family, see old friends and have fun.

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Daniel Romila VE7LCG

Modifying LED Christmas Lights Strings

One of my big “electronics engineering” projects started as a necessity. It was Christmas.

My roommate entered the dollar tree store, where all products are just C\$1.25 plus taxes. And she bought a LED Christmas lights string, which looks like this:

My panic button immediately sounded loud and clear. This LED string is power supplied by two batteries, so in a total it wants 3 Volt. Oh, well, nothing so bad. I do have some rechargeable batteries. No problem.

And then I found she bought 17 of them, just because they were cute, and they are in so many colors and models. 17 of them, all power supplied from small boxes requiring 2 pieces of 1.5 Volt batteries.

It was already Christmas, so it was too late to cut cables, boxes and try to save the situation. The LED strings went directly into the Christmas tree and that was it. This means that all holidays I replaced batteries, I recharged NiMH batteries, and so on. Just 34 of them.

I decided that the situation will not repeat the next year. I had to do something to power supply the strings from the wall. The idea was:

- Get a 3 Volt switching power supply
- Make a power supply line with a bunch of connectors inserted in it. The lower end of the supply line would be

connected into the 3 V switching power supply and the rest of the line would climb into the Christmas tree, with the connectors offering the possibility to insert the LED strings into them.

- The LED strings themselves had to be modified. I had to cut the wires going into the batteries boxes and solder instead some connectors, connectors to be in pair with the connectors from the power supply line.
- I decided to allow strings to be connected one into another, too. So, more male/female pair of connectors. Practically all LED strings had one male connector at one end, and a female connector at the other end.

I could not get a 3 Volt power supply solid and reliable enough for future extensions. (If there are 17 LED strings now, expect to be 40 of them in no time.) So I ordered online a 5 V power supply, with the intention to modify it for 3 V.

All those actions happened in January 2019, after the Canada Post strike. The power supply that came looks like this:

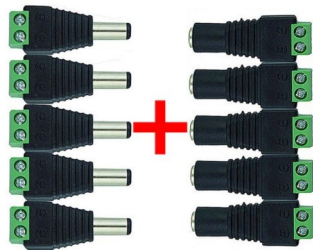
It's OK. Nothing fancy about it. It has an adjustable semi-pot in front, next to the contacts, which allows to go down to ~3.75 V. I tried, and the LEDs were too bright. I had to disassemble the whole thing and unsolder the 2 K semi-pot and replace it with a 10 K semi-pot. This allowed to go down to 3.17 V. Taking into consideration eventual voltage lost on



the power line put together by me, it was supposed to be OK. My experiments, when everything was finished, shows that it is absolutely perfect.

I was faced with the problem of choosing the male-female pairs of connectors for the strings and for those inserted on the power supply line. My first choice for power connectors were dedicated power connectors. I do have a bunch of them:

DC male 5.5*2.1 DC female 5.5*2.1



But they easily burn inside and no longer make a connection. They have screws, and after several manipulations of the strings the wires would go out and even make short-circuits. It was not good enough.

So I moved my focus towards something soldered and encapsulated. The cheap and solid thing for this are the male-female USB connectors. While I would not use USB voltage (5 V) this was not important in the grand scheme of things. The USB connectors are cheap and reliable [see right margin].

In order to do good soldering connections I used my trusted European style soldering gun:

I also used a small vise, magnifying

glasses and a big magnifying lens for the final control:

This big lens has 12 LEDs. It was sold as



a 30x magnifying lens, which would have made it a kind of a microscope. But it does not have 30x magnification, just 5 - 8. I paid C\$18 for it. If you think I am a sucker, I agree with you.

So, to cut a long story short, the project is a success. The final construction is shown bottom right.

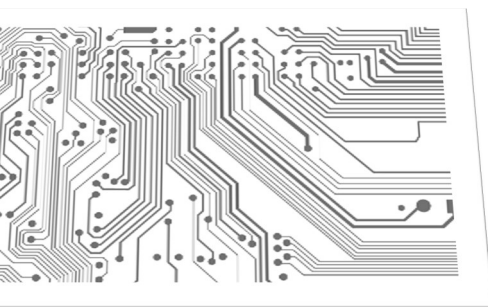
The power supply line is made from speaker wire. I inserted female USB connectors at every 30 centimeters. I considered that 7 such "branches" would be enough for the whole Christmas tree.

In a total I soldered 41 USB connectors.

~ 73, Daniel VE7LGC



March 2019



TECH TOPICS

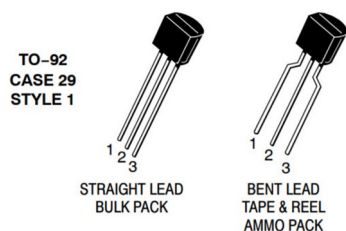
Daniel Romila VE7LCG

Through The Hole Electronic Components For 2019: A Guide For Hobbyists

I can still find many schematics with electronic components that are no longer manufactured. Let's just say that those of us old enough will always have the tendency to use somewhere a pair of BD135/136 transistors, while they are now obsolete.

So I try in the next paragraphs to share from my recent experience whatever electronic components are now in mass production and can be found cheap and readily available on the Internet, on various Chinese websites. I do not sell anything. My own experience with buying from the Chinese websites is good. I only avoid banggood.com website which does not allow negative reviews, so all products have only super reviews, and all sellers look honest, which unfortunately is not true. Always read reviews about the seller and the product you intend to buy, starting with the worse ones. Expect months until the product will arrive in your mailbox: it takes 6 - 10 days from China to Vancouver and all the rest is due to Canada Customs and Canada Post.

General purpose NPN and PNP transistors:



- I use 2N3904 (NPN) and 2N3906 (PNP). They are good up to 300 MHz with DC current gain in the range of hundreds, and base collector working voltage over 30 V. The declared noise

figure is 5.0 dB. The general price is C\$1.07 for 100 pieces, shipping and taxes included.

- The NPN transistor 2N2222A is similar to 2N3904, but it has a lower noise figure, 4.0 dB. They can be found for C\$1.23 (shipping and taxes included) for 100 pieces. Exactly the same price is for 2N2907A, a PNP transistor which can be the pair of 2N2222A. It's unitary gain frequency is 200 MHz.
- Other popular NPN general purpose transistors are BC549, which are supposed to have a bit lower noise than 2N3904, which is not necessarily true. They have all kind of letters after their name, which indicate the gain. BC549B can be found with C\$1.34 for 100 pieces, shipping and taxes included. The PNP pair is BC556, BC557, BC558, BC559 and BC560. My preferred choice is BC556B which costs C\$1.27 for 100 pieces, shipping and taxes included.

In this category I simply always use 2N3904 and 2N3906. I found they really work at 200 and something MHz and they are always with a hfe around 350. I always have handy several hundreds of them. While there are many other transistors with lower characteristics, they do not have lower prices.

General purpose radio frequency bipolar transistors:

My choice is SS9018. It is NPN. It works up to 1100 MHz. They can be found with C\$1.27 for 100 pieces, shipping and taxes included. It is to mention here that this transistor works only up to 15 V emitter-collector voltage. I am not aware of a similar PNP version of this transistor.



High voltage general purpose transistors:

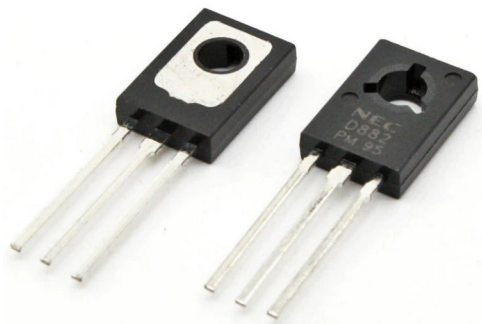
Many hobbyists revive tube based equipment and modify them and add various functions. Having transistors that can work at high DC voltage can simplify the modifications.

- MPSA42, NPN, works up to 300 V, at least up to 50 MHz. C\$1.27 for 100 pieces, shipping and taxes included.
- KSP44 is a NPN transistor that can work up to 400 V and 0.32 A in the TO-92 plastic capsule. It costs C\$1.92 for 100 pieces, shipping and taxes included. No info available about it's maximum frequency. Most probably it is also OK in shortwaves.
- 2N5551, NPN, can work at higher frequencies, up to 300 MHz, but at lower voltage, max 160 V.

Medium power bipolar transistors:

I still see in the published electronics schematics BD135/136, BD237/238 and similar.

- I use 2SD882 (NPN) and 2SB772 (PNP) . The total power of such transistors is 12.5 Watts and the transition frequency is 100 MHz. The price today, in February 2nd 2019 is C\$1.60 for 50 pieces of 2SB772 and C\$1.86 for 50 pieces 2SD882, shipping and taxes included. There are sellers who say they send "pairs" That statement is false. They send an equal number of NPN and PNP transistors. They never match the gain of the transistors.

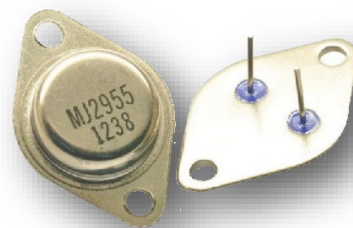


Power bipolar transistors:

- 2N3055 NPN is still around. A very long life for this transistor. 5 pieces cost C\$1.78,

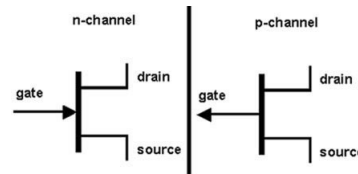
shipping and taxes included. The total power is 115 Watts, up to 2.5 MHz, 15 A max and 60 V max.

- MJ2955 is the PNP pair of 2N3055. It is more expensive, at C\$2.47 for 5 pieces, shipping and taxes included. Both transistors look the same, same characteristics.



Radio frequency FET (field effect transistor) general purpose transistors:

- BF245 is my choice. It is designed for VHF/UHF amplifiers, up to 700 MHz. All my oscillators have such FET after them, for separation. It is important to look in the datasheet if BF245A, B or C is what you need. 10 pieces (ten, not one hundred) can be bought with C\$1.88, shipping and taxes included.



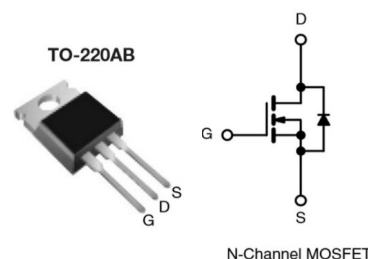
- BF256 works even at higher frequencies, up to 1 GHz. It is a more expensive transistor, C\$6.92 for 20 pieces, shipping and taxes included.
- J201 is a popular audio j-FET transistor. I saw it in many schematics. I always use BF245 instead of J201, which is for only audio use and costs C\$1.98 for 10 pieces shipping and taxes included. Many transistors are more expensive not for better characteristics, but because they are not so popular.

Radio frequency power FET:

Here the general family IRF of transistors is used almost in all transceiver kits, in the TO-220 capsule.

- IRF510 is around C\$1.87 for 10 pieces, shipping and taxes included. It works up to 100 V and 5.6 A. The input capacitance is 180 pF.
- IRF840 are C\$1.7 for 10 pieces, shipping and taxes included. It works up to 500 V and 8 A. The input capacitance is huge, 1300 pF.

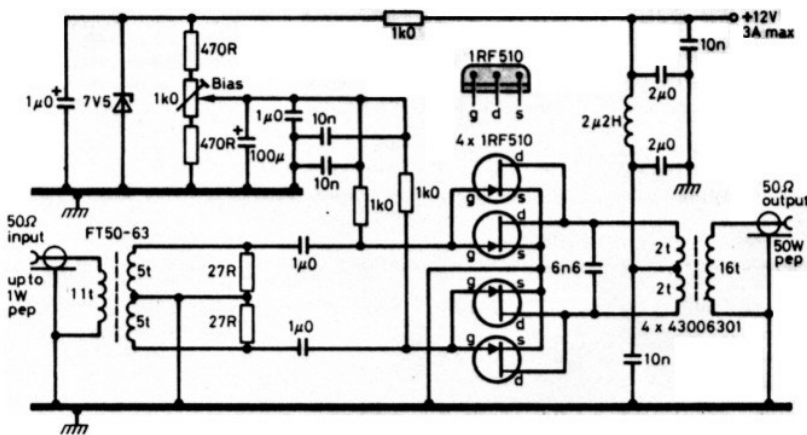
Both transistors have the tendency to self-oscillate and can quickly burn.



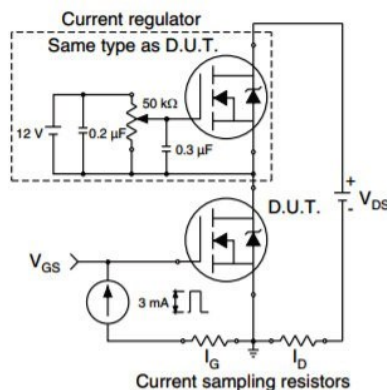
N-Channel MOSFET

March 2019

G3PCJ's broadband RF amplifier is capable of providing 50-watts PEP output on 1.8/3.8MHz with a 12V supply. It uses four IRF510 devices in a parallel-pushpull configuration. Bias control is set for about 1A (total) standing current.

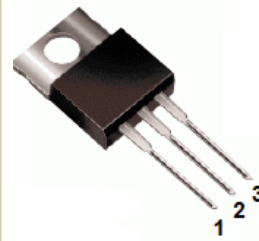
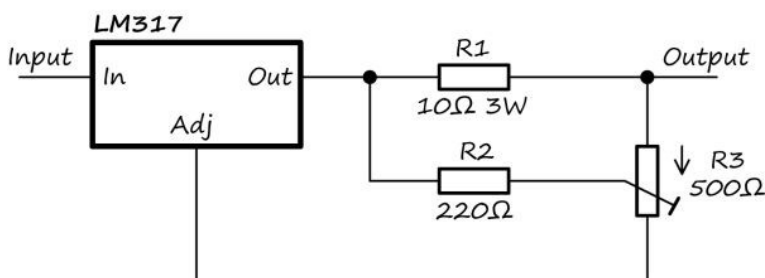


While there are current regulators made with the same IRF transistor given in the datasheet(s), they have the disadvantage of requiring floating ground.



Current regulators:

LM317 adjustable current source approx. 125-400mA range



1. Adjust
 2. Vout
 3. Vin
- Heatsink is connected to pin 2

• LM317 is available as variable voltage regulator, but one use of it is as current limiter for such power FET schematics as the power RF amplifiers.

• The design and explanation of such adjustable current source is available at:

http://www.imajeenyus.com/electronics/2016/0530_adjustable_current_source/index.shtml

Voltage regulators:

• LM 317 is available in various capsules. The most powerful is in the TO-220 capsule. The maximum output current is 1.5 A. The output is between 1.25 V and 37 V. minus is at the ground. They can be found 10 pieces for C\$2.10, shipping and taxes included.



- LM337 is the pair of LM317, but this one has the plus at the ground and this is why it is called a negative voltage regulator. The characteristics are similar with LM317, but the price is double.
- It is worth mentioning the family of AMS1117 voltage regulators. They are sold as SMD (surface mounted devices) but I successfully use them through the whole.

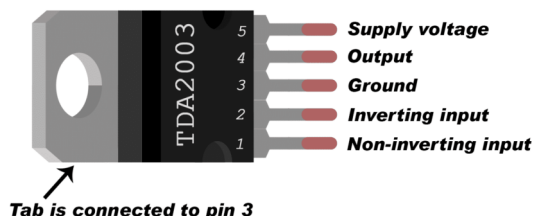
I always have several hundreds of them handy. They are available as adjustable or fixed low dropout 1.2V, 1.5V, 1.8V, 2.5V, 2.85V, 3.3V, 5V regulators. They are available for C\$2.16 for 100 of them, shipping and taxes included.



- WS78L05, 78L06, 78L08, 78L09, 78L12, 78L15 are fixed voltage regulators. It is a good idea to buy a set of them, like 120 total number of pieces, 20 pieces for each value, 6 values, with C\$2.62, shipping and taxes included.
- I will finish my 2019 update with some integrated circuits. We whom are old enough remember the good old days of using MBA810 as final audio integrated circuits, and even MBA790 (TBA790 and TBA810 in other markets name). They are still available, but very expensive.

Audio integrated circuits:

- LM386 is the most popular final audio on the Internet posted schematics. I was fooled by it, too. Yes, it works. Yes, it can have an amplification between 20 and 200. It costs C\$4.54 for 100 pieces, shipping and taxes included. But it is noisy and it cannot drive a speaker. It cannot drive a simple speaker put on the desk. It is a headphones amplifier, and a very noisy one.
- TDA2003 has high power output, up to 3 A, built in over temperature protection and short circuit protection between all pins. It is foul proof. It works between 8 V and 18 V. It can easily drive 10 Watts output, if necessary. The gain is 40 db (that is 100 times for voltage amplification). It is more expensive, but it will not die on you. 10 pieces are C\$1.54, shipping and taxes included.

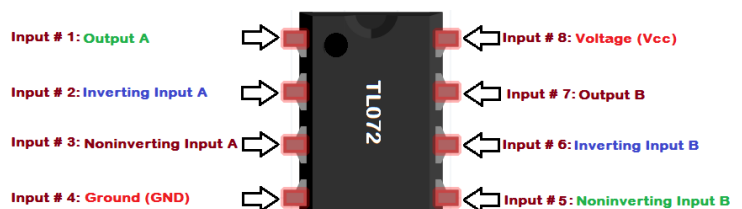


- LM741 operational amplifiers (one in the capsule) and LM324 (4 in one capsule) are still available to buy and schematics put their name just for knowing it is an operational amplifier circuit there. In practice everybody replaces them with better and newer operational

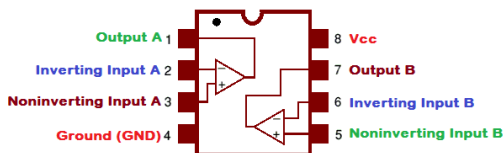
amplifiers, which have lower noise and better overall performances. 10 pieces are available for C\$1.32, shipping and taxes included.

- TL072 is a low power low noise J-FET operational amplifier, 2 of them in one capsule. The cut-off frequency is 3 MHz, total harmonic distortion is 0.003% (yes, there are 3 decimals in that number). The cost is C\$0.92 for 10 pieces, shipping and taxes included.

TL072 Pinout



TL072 Animation

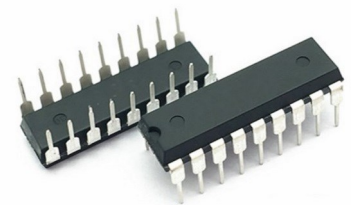


Symbolic Representation



TL072

- TL084 is the version of the above, with 4 op amps in a capsule. It can be convenient for making low frequency filters with only one chip. It's C\$1.04 for 10 pieces, shipping and taxes included, so the price per internal op amp is lower than for TL072.



Radio frequency mixers:

- SA602 is an obsolete product, replaced by SA612, also found as NE612. Those components continue to be very expensive, costing over one dollar each. 10 pieces are sold with C\$11.15, shipping and taxes included. Hobbyists tried to replace them with FM tuner circuits, which are very alike internally, but unfortunately the price is identical. While the designer boasts the double balanced mixer will eliminate the carrier without external adjustment and I saw many DSB schematics with it, practical none of them work and the carrier flows into the rest of the built device. I found information that the very

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common TA2003 AM/FM cheap radio integrated circuit contains similar electronics inside in the FM part and can be used separately and ignore the unused pins. I did not try it myself. There is a big difference in price. 10 pieces of TA2003 are only C\$1.78, shipping and taxes included.

Note: I could not find any direct replacement of the obsolete dual gate MOS-FET 40673. I simply use BF998, which is SMD and costs around 18 Canadian cents each. It is a totally different animal, with different characteristics, more amplification and lower noise. BF981 and BF982 are still around in the last 24 years, at least. Their terminals can be bent and used through the holes, but I would not do it. BF981 and the rest of the family wants a metallic case, with the drain separated through a wall. I worked a lot with them, especially with the cheaper BF961. I saw them on Internet schematics with LC circuits in the first gate and LC circuit on the drain, just thrown on the PCB, with no grounding. It never worked for me and I doubt it works for anybody

else. It is also worth mentioning the NPN transistor 2SC1969, used in old citizen band transceivers as final RF power transistor. It knows up to around 30 Watts, theoretically. It is still around, and cheap.

In the final part of this article I want to underline I do not sell anything. I only wanted to update an eventual hobbyist who comes back into the electronics building/ham radio hobby after a while and wants to have a starting point for what components to buy and use, based on his/her previous old time experience. The SMD components are cheaper. But many of us, hobbyists, use breadboards and build things that we never need, just for fun. In this way the through the hole components become cheaper, because they can be used in a project and taken out and used again and again in other projects. Please read reviews and about the experience of other buyers before buying online.

~

Burnaby Amateur Radio Club Annual Swap Meet



Swap Meet

The 2019 BARC Annual Swap Meet is Sunday, March 03 at the [Queensborough Community Centre](#) in New Westminster from 10:00am until 1:00pm. (more info)

General Admission: \$6 (children 12 and under are free)

Vendor Tables: \$25 each (includes one person). If you are sharing a table, add \$6.00 per additional person. We require the names and call signs of all vendors for our records.

To reserve a Vendor Table please contact Lou, VE7CGE at loucge@telus.net or Phone: 604-291-1569



Tidbits from the Amateur Radio World

*US Navy finds ham radio training makes
“workers better at their jobs”*

Southgate ARC: Mike K8RAT

Can learning amateur radio make for better engineers and software developers?

Writing in C4ISRNET - Electronic Warfare, Eric Tegler says:

When a group of [US] Navy engineers and software developers took time away from their day jobs in December, they spent the time pursuing a task long considered passe: they became licensed amateur radio operators.

Some 23 employees from Naval Air Warfare Center Weapons Division (NAWCWD) took a week-long class in amateur radio at Point Mugu, California culminating with an FCC amateur radio license test. All passed and are certified at the “technician” level for amateur radio operation [permitted 200 watts on some HF bands, 1500 watts above 30 MHz].

Now, Navy officials say the move may make the workers better at their jobs. The staff gained an understanding of radio frequency (RF) propagation that’s essential to what they do, said Brian Hill, electromagnetic maneuver warfare experimentation lead and collaborative electronic warfare supervisor at NAWCWD.

Hill, who earned his amateur radio license in high school, noticed that while most of his department’s recent hires had degrees in computer science, many had little background in RF theory or operation.

“You can explain antenna patterns and concepts like omni-directional vs directional using Smith charts, but it’s helpful to add a demonstration to really convey the concept,” Hill said. “You can explain modulation as a concept, but for a demo... let them listen to how modulated digital signals with audio frequencies sound... For those who never knew the joy of hearing a 2400 bps modem connect over a telephone line, it was a new concept!”

These concepts are central to electromagnetic maneuver warfare.

“We need to be able to have awareness of all threats and opportunities from [zero frequency] to light within an integrated system,” Hill said. “Our adversaries are looking at the entire spectrum to use against us, and we need to do the same. Having awareness of how the atmosphere changes from daylight to night and how that affects propagation of [high frequency] is important.”

This can be critical for young developers and engineers whose experience is typically limited to the UHF/EHF-based systems now in vogue across communications, guidance and ISR technologies.

Read the full story at:

<https://www.c4isrnet.com/electronic-warfare/2019/02/06/can-learning-ham-radio-make-for-better-engineers-and-software-developers/>

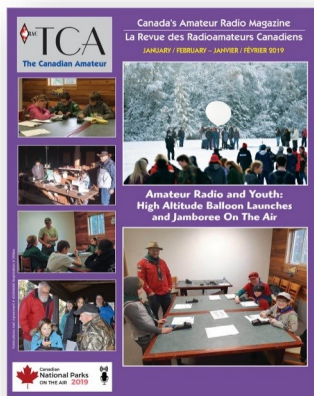


March 2019



"Parks Canada is a proud supporter of the Canadian National Parks on the Air 2019 project hosted by amateur radio operators in Canada."

~ Parks Canada



The January 2019 RAC TCA magazine features our JOTA story

National Parks On The Air

SARC is actively looking to participate in this National Event.

Rules

The CNPOTA Event is supported by [Radio Amateurs Of Canada](#) and [Parks Canada](#).

Duration

The CNPOTA event will run from 00:00 UTC January 1, 2019 until 23:59 UTC December 31, 2019.

Goals

To promote Canada's National Parks and National Historic Sites to the world.

To promote Amateur Radio portable operation creating activity on the air from as many of the officially-listed Parks Canada Administrated units as possible. Also we need people from their home QTH to chase these activations.

Eligibility

The CNPOTA event is open to all licensed Amateur Radio operators world-wide.

Administration

The Canadian National Parks on the Air Program will be administered only through this web site.

No paper logs or QSLs will be allowed for award credit.

CNPOTA Units, QSOs, Bands and Modes

The complete list of CNPOTA [Units](#) and their alphanumeric unit identifiers is available here.

Units eligible for the CNPOTA event are based on the officially recognized Parks Canada administrated National Parks and National Historic Sites. As of December 18, 2018, there were 220 Parks Canada

"Administrated Units". Units not on this list are ineligible for CNPOTA credit.

QSOs (contacts) made on all Amateur Radio bands and modes are permitted, with the exception of the 4-Meter and 60-Meter bands. Cross-band QSOs, QSOs made through remote stations, repeaters, digipeaters, Echolink, or IRLP will not count. A specific exemption is granted for QSOs made through the recognized Amateur Radio satellites and through the International Space Station.

You may work any Parks Canada administrated unit once on each mode, on each band (with the exception of 4-Meters and 60-Meters) for CNPOTA credit. There will be no tracking of QSOs by band or mode.

Exchange

The exchange is RST plus the Parks Canada administrated unit identifier (eg. "BC01"). See [Parks Lookup](#) for a complete list of accepted unit identifiers.

Example 1: Excellent phone contact from Banff National Park: - 59 AB01

Example 2: Readable Weak CW contact from Alexander Graham Bell Historic Site: - 469 NS10

RST may be omitted for Satellite contacts. Log files uploaded in ADIF format will be accepted without RST when the <sat_name> tag is present.

Click on the graphic below for the event brochure.

Canadian
National Parks
ON THE AIR 2019



QRT

John Brodie VA7XB

Broadening Your Horizons

Throughout this newsletter you will find references to technical subjects, topics and events that may inspire you to pursue a particular specialized activity. However, here are a few suggestions for goals you may not have thought of to further your personal involvement in amateur radio:

1. **Build something.** This is part of the ham radio tradition. Nowadays, things are easier to build, with the variety of kits available from the Internet and your local electronics retailer. For example, you will find a large collection of worthwhile projects in past Communicators. Have a look via our blog site: <https://ve7sar.blogspot.ca>. Soldering is a skill that all hams should have. Many simple home-made antennas are described in The Communicator, handbooks, magazines and on the Internet and work well - try building one.
2. **Learn CW.** A large variety of learning and skill-enhancing programs are out there on the Internet, mostly free. For example: Morse Trainer <http://www.g4fon.net/CW%20Trainer.htm>. If you already know Morse Code and simply wish to improve your skill, my personal favourite for simulating contest conditions is: Morse Runner: <http://www.dxatlas.com/download.asp>.
3. **Master a new technical skill:** pick a subject that interests you and read up on it. How about antenna modeling, or propagation prediction, or

impedance matching? Then give a talk to SARC about what you have learned and enlighten the rest of us.

4. **Dig out your radio manual** and read it from cover to cover, trying out everything that is described so that you master its complexities - you never know when you might need to program your radio on the fly, should disaster occur and you are called upon. It will also enable you to get more out of your device.
5. **Help a ham in need:** think about your fellow hams and who might need a helping hand (for example) to erect an antenna, or work through difficult software, install power poles etc. Possibly you could also offer to give a lift to the next SARC meeting or breakfast get-together for one of our handicapped members.
6. **Get someone interested in ham radio,** then bring him/her out to an SARC meeting and introduce him to the group. Direct him/her to some ham

*Some suggestions
on broadening your
Amateur Radio
involvement*

This is Paul Andreassen. Paul is in our current Basic class. Because he has some scheduling conflicts ahead, he has written his Basic Exam early and he is smiling... he got 100% on his exam.

Congratulations Paul VE7NUD!



March 2019

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SARC QSL MANAGER

Heinz Buhrig VA7AQ
15684 102 Avenue
Surrey, BC V4N 2G4

SARC REPEATER MANAGER

[repeater @ ve7sar.net](mailto:repeater@ve7sar.net)

radio literature and show off your station. Offer to give a talk at your local Senior Citizens centre, Scout hall or service club. Explain the benefits of ham radio if there is ever an emergency where power, telephone and Internet are not working. Get involved in your local Neighbourhood Emergency Planning Group and show them how ham radio can assist when that disaster hits.

7. **Suggest a worthwhile project or event** for your group and volunteer to organize it. Don't just leave it to the Executive to do all the planning.
8. **Pursue some new aspect of your hobby.** If FM on VHF/UHF is all you've ever done, there is a world of interesting options open to you. Explore new bands or modes. If you're in an apartment or townhouse complex and have been unable to get on HF, think about the digital modes especially JT65 or FT8, which have revolutionized HF communication.

With these two new modes, you only need simple equipment, 20 watts or less of power and a modest antenna. All exchanges are done on the keyboard using free software.

9. **Maybe the thrill of DX contesting holds some interest for you.** If so, let your Exec know that you want to join the ever-growing number of members who are involved in the contesting program. Then participate in contests at the OTC, where we have 2 state-of-the-art HF stations set up for members to use.
10. **Set yourself an achievable goal and earn it:** This could be Worked-All-States or DX Century Club. Maybe improve your score by X% in your favourite contest, or get your CW speed up to 20 WPM. Improve your Fox Hunting skills so that you can find at least 3 foxes instead of only one. Work 10 new countries on the lower HF bands. Find out how to get on Logbook of the World and do it.

~ John VA7XB



Your newsletter is the best I have seen. Lots of good news in it. Please add me to its emailing.

I live in Saanich right next to that other place, Victoria. I'm 73, had my own ham radio web site for years (a lot of work) and have worked in the Saanich EOC and within my church in emergency preparedness. Anyway it would be nice to get mailings of your newsletter to help me keep up and also to pass on info to others who may want to work on their ham ticket.

D. Hilton VA7DH

Spring

It's March

As a result of our February snow day, and cancelled General Meeting, we will try to re-schedule the missed presentation to the March 13th meeting. Mr. Bruce Claggett VE7HHI, Senior Managing Editor at AM radio station News1130 will speak on the media in general and how they get messages out in an emergency.

Bruce is a BCIT journalism graduate and former faculty instructor who started his career as a summer announcer and feature reporter at Mountain FM in Squamish back in 1986. Since that time, he has been heard as a newscaster and reporter at CKCQ Quesnel, CFVR Abbotsford and CKNW Vancouver. He has also worked in the film industry, taught high school in Vancouver and earned degrees from UBC in Education and Geography. In 2006, he received a Jack Webster Foundation Poynter Institute Fellowship. In 2013, he became a finalist for the Jack Webster Award for Excellence in Digital Journalism. Please join us, visitors always welcome.



SARC hosts an Amateur Radio net each Tuesday evening at 8 PM. Please tune in to the VE7RSC repeater at 147.360 MHz (+600 KHz) Tone=110.9, also accessible on IRLP node 1736 and Echolink node 496228.

On UHF we operate a repeater on 443.775MHz (+5MHz) Tone=110.9 or IRLP Node 1737.

	SARC Net 20:00 Hrs
1 st Tuesday Standby	Drew VA7DRW Dixie VA7DIX
2 nd Tuesday Standby	Jinty VA7JMR Sheldon VA7XNL
3 rd Tuesday Standby	Rob VE7CZV Vacant
4 th Tuesday Standby	Kapila VE7KGK John VA7XB
5 th Tuesday Standby	Robert VA7FMR John VE7TI
Want a turn at Net Control? Contact the SARC Net Manager	

Down The Log...

SARC Monthly Meetings

2nd Wed. (Sept-Jun)
1900 hr at the PREOC
Emergency Mgmt BC
14292 Green Timbers
Way, Surrey, BC

Weekly SARC Breakfast

Saturday between 0800
and 1000 hrs at the
Kalmar Family Restaurant
8076 King George Blvd.
Surrey

SARC Net

Tuesday at 2000 hr local
on 147.360 MHz (+)
Tone=110.9

SEPARS Net

Tuesday at 1930 hr local
on 147.360 MHz (+)
Tone=110.9

VE7RSC Repeaters

2m: 147.360MHz+
Tone= 110.9Hz
IRLP node 1736
Echolink node 496228

1.2m: 223.960 Mhz -1.6
Tone=110.9

70cm: 443.775MHz+
Tone= 110.9Hz
IRLP node 1737



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